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A NEW YORK CITY FIRE HOUSE

High Standard of Efficiency Promotes Ready Service—Modern Equipment at Hand—Manhattan Ladder Company Responds to Largest Number of Alarms in the World—Description and Reports

By F. E. PUFFER

VIEW OF FIRE APPARATUS—NEW YORK CITY

To the average citizen or city official the most interesting and instructive of New York's fire houses are not those occupied by appliances especially useful in large cities, such as water towers, searchlights and universal nozzles, but those where the most recent ideas have been carried out in the construction of houses in the residence districts, where requirements are much the same as those of every town and city in the country. It is worthy of note in passing, however, that New York City contains the fire company, an ordinary Hook and Ladder organization, that responds to the largest number of alarms of any company in the world. This company, known as Hook and Ladder No. 18, responded to 1,120 calls in 1904. The record for engine companies was held by Engine No. 17, which responded to 1,101 alarms. These companies, situated in the lower East Side, are called upon, for the most part, to extinguish small fires—blazing curtains and the like.

In New York City's residence section, apparatus houses containing engine and hook and ladder together, have been established in late years, and several of this type are now under construction. In 138th street, near St. Ann's avenue, in February of this year, two companies were organized in a new house; they were Engine No. 83 and Hook and Ladder No. 29. This fire house, as handsome as any in the city, has the unusual advantage of a situation on a wide street. The first story of the building is of Indiana limestone, with granite base; the second story is of brick, with terra cotta cornice. The wide sidewalk in front is of concrete, the driveways being finished in four or five-inch squares to afford good foothold.

On entering the house, the patrol desk at once attracts attention, and it is there that the visitor explains his business. A fireman, on duty at all hours, attends to the telephone and keeps the journal. From this point the horses, as well as the apparatus of both companies, are all in view. Five horses are stationed in the center line of the 50x70-foot floor, and three horses are next to the wall, so stationed that no animal moves as much as thirty feet to reach his place in the shafts. The time occupied in hitching up is five or six seconds.

MODERN EQUIPMENT A FEATURE

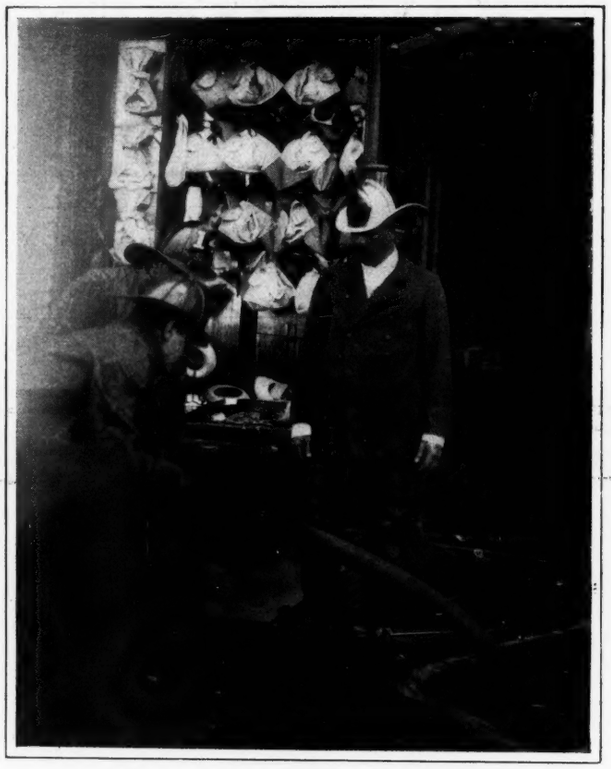
On the right of the floor, as one enters, is the engine, and in the rear of it, the hose wagon. The engine is a Metropolitan, third size, Crane neck, with sectional vertical Fox water-tube boiler, measuring 32x62 inches. The engine is double, steam cylinders, 7½ inches, stroke of piston 7 inches; weight, with two gages of water, 8,030 pounds. The machine is drawn by three horses; the wheels are provided with Firestone tires, and the cost was $5,225. The new features of this engine are a chock brake, which, by means of a ratchet, holds the brake where set; and a short suction pipe, which is carried for use in coupling two engines to one hydrant within a convenient space. Both of these devices are credited to Chief Croker's ingenuity. The hose wagon, known as second size, is a four-wheeled vehicle of conventional design, made by the Peter Barrett Manufacturing Company, Brooklyn, N. Y. One thousand feet of 2½-inch hose are carried in the bed of the wagon, and 500 feet on a reel underneath. The outfit of small tools carried consists of one hook, one axe, four 2½-inch nozzles, reducers and increasers, one 1½-inch nozzle, one Siamese nozzle made by the Woodhouse Manufacturing Company of New York, one hose jacket made by the Cooper Hose

Leak Stop Company of Minneapolis, one hose hoister, one perfection pipe holder, two scaling ladders, and a life net.

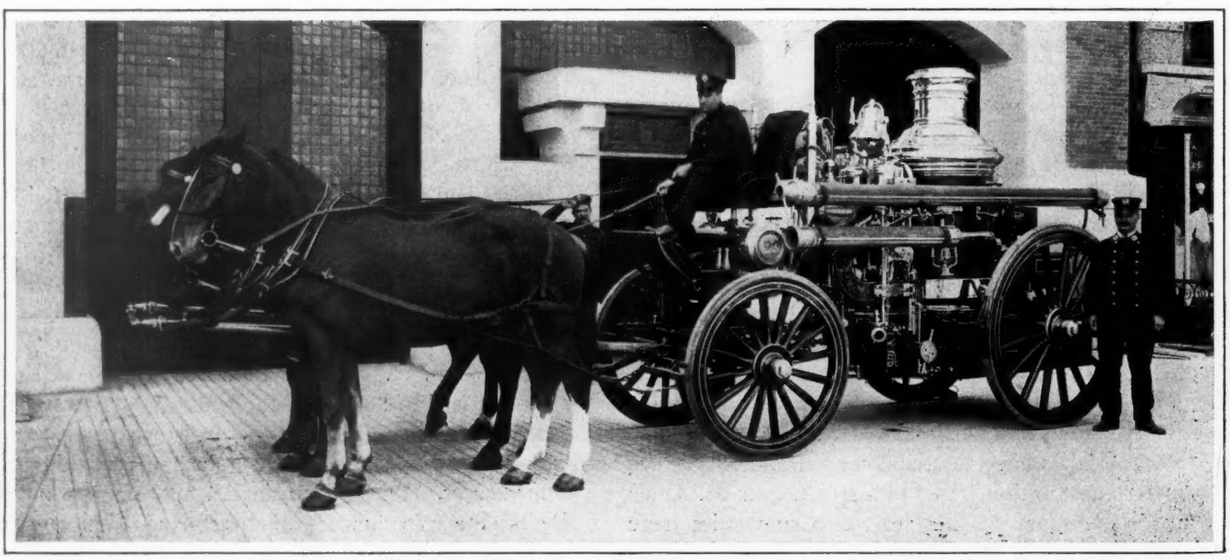
The Hook and Ladder apparatus, on the other side of the house, is a new American LaFrance Aerial 65-foot Extension Ladder. This ladder, on being released, raises itself by springs and air pressure about four feet, and two men at the cranks complete the elevation. Company No. 29 can raise this ladder with extension in 18 or 20 seconds. A 65-foot ladder reaches the cornice of a five-story building, or gives entrance to the sixth floor of a higher building. The small tools carried by this truck are as follows: Two Babcock extinguishers, four axes, one crowbar, wire cutters, one tin roof cutter, one door forcer, one Siamese nozzle, twelve hooks of various sizes, two picks, two pitchforks, two malls, two key wrenches for shutting off gas, two 35-foot ladders, one medical bag containing liniment, bandages, scissors, etc., one life bag, two roof ropes 125 and 150 feet in length respectively, one battering ram, four Dietz King Fire Department lanterns, shovels, rubber gloves, red signal flags, roof hose hoister, saws, hatchets, brace and bits. Five lengths of 1½-inch hose are carried in the rear of the truck; it is drawn by three horses, and the wheels have Firestone tires.

An old, spare engine is kept in the rear of the house, suitable for service in emergencies. Back of the engine house is a yard, thirty feet wide, on one side of which is a feed house. The heating apparatus for the building, as well as the boiler and storage tank for supplying hot water to the fire engine, is in the basement of the fire house. A gas clothes-dryer, made by the Chicago Dryer Works, and a carpenter's bench complete the miscellaneous equipment.

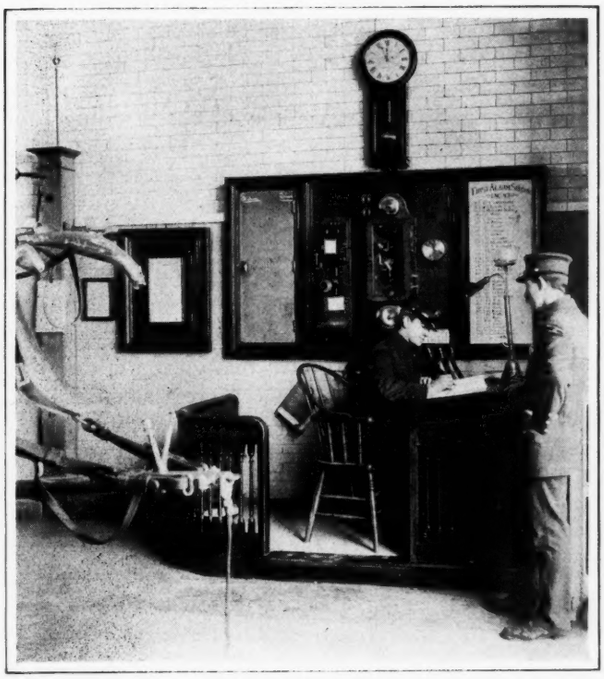
On the second floor are the living rooms of the two companies. The captains or foremen have a neat office, with roll-top desks, two cots and comfortable furniture. A private bath adjoins their office. In the dormitory are cots for twenty men, a sufficient number for the members of both companies who sleep in the building at any one time. The truck company is composed of a captain, a lieutenant and eighteen men, and the engine company has a captain, two lieutenants, two engineers and ten men. The men have one day in five off duty, besides three periods of twelve hours in each month. Besides the dormitory, the men have a sitting room and ample baths. Stairs lead from this floor to the top of the hose tower above. The appearance of the walls and furnishings of the house shows that the men are very well taken care of from a hygienic standpoint. The walls of the living rooms are finished with cement and plaster, with marble base. The apparatus room has a wainscoting of brick, seven feet high, with opal glass tile above. The cost of the building was $41,690, and it was finished in 1905.



FIRE CHIEF EDW. F. CROKER—NEW YORK CITY
(Showing Work at Fire)

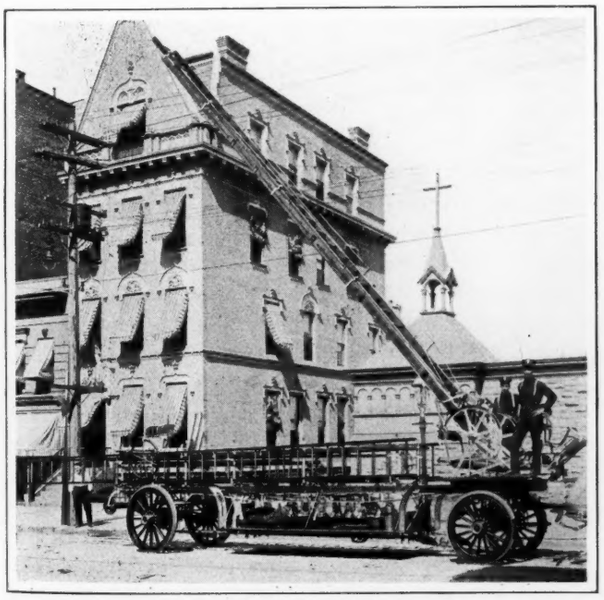


ENGINE 83—NEW YORK CITY



FIRE PATROL DESK—NEW YORK CITY

These companies, since their organization in February, have had about a dozen calls a month. Located in a growing section, this number will undoubtedly increase. The greatest distance they have to go on first alarm is about half a mile, on second alarm about a mile, and on third about a mile and a half. At nearly half of the stations to which they respond on first call they are expected to be the first company to arrive; these stations, marked in red figures on the bulletin at the patrol desk, they are expected to reach in less than three minutes. As an illustration of the work that is sometimes required, and of the forms upon which the records are kept, the following reports of service performed at a fire on June 12 are interesting.



HOOK AND LADDER 29—NEW YORK CITY

Fire Department

Bureau Chief of Department,
ENGINE COMPANY No....83...
New York, ...June 12,...190..6..

Edward F. Croker,
Chief of Department.

*Sir: In compliance with existing orders, I have the honor to submit the following report of the operations of this Company at the fire at No....*695-733 E. 147th St., N. S.... *Station* ..2365,.. *at* ..12:43.. *o'clock* .A.. *M., on the* ..12th.. *day of* ...June,... *190..6... The ..... alarm was received by* ...telegraph... ..3.. *minutes were consumed in hitching up and getting to the* ..single.. *hydrant located at* ..S. E. cor. 147th and Bergen Ave.,. *during which we were delayed ..... min. by..... ..... The hydrant was found in* ...good... *condition ..... with* ..28x28.. *lbs. water pressure. Reported to* ....Chief Sloan.... *and were by* ....him... *ordered to* .....stretch line and start water..... ...1... *min.* ..was.. *consumed in stretching in and getting a stream on the fire, during which we were delayed ..... min. by ..... The pipe was first taken to* ....first floor by doorway.... *and* ..1⅛.. *inch stream kept there ..... hours* ..20.. *min.; then taken to* ....water tower of Hose Wagon 58.... *and* ..1⅛.. *inch stream kept there* ...2... *hours* ..15.. *min; then taken to* ...runaway of ...No. 727... *and* ..1⅛.. *inch stream kept there* ..14.. *hours ..... min. Total time of stream and size* ..1⅛.. *inch on fire,* ..16.. *hours* ..35.. *minutes. The supply of water was* ..good,.. *and the estimated number gallons of water used, averaging 250 gallons per minute for a 1⅛-inch stream for total working time, was* ...250,000... *gallons.*

Company was on duty at the fire ..17.. *hours ..... minutes; out of quarters* ..17.. *hours* ..17.. *minutes;* ..650.. *feet of* .2½. *hose in the line, with* ..1⅛.. *inch* ....controlling and open.... *nozzles. Average pressure on line was* ..180.. *lbs., and highest pressure was* ..240.. *lbs. Burst* ...1... *length.. of* .....rubber-sheathed 2½.... *hose, issue of* ....Sept., 1891,... *at* ..200.. *lbs. pressure. Department property lost ..... Department property found ..... Department property destroyed .....*

LOUIS A. CRACO,
Foreman, Engine Co. No ..83..

HOOK AND LADDER COMPANY NO. ...29....

(First part the same as the Engine Company's report.)

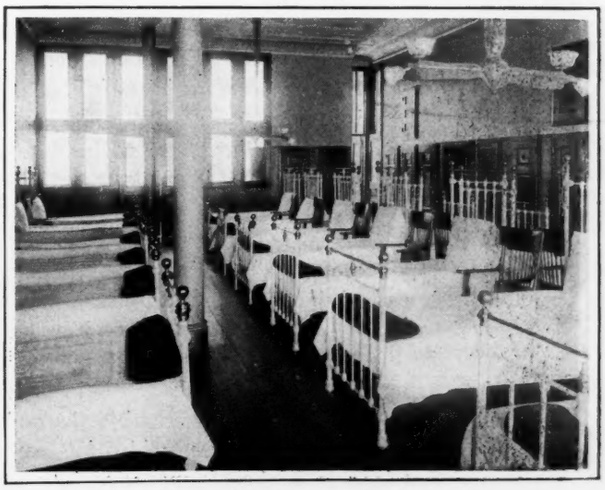
Reported to ...Chief Sloan... *and were by* ...him... *ordered to* ....stretch second line from Engine No. 41; operated same... *at work..*1..*hours* ..30.. *minutes, after which were by..*Chief Croker..*ordered to* ...cut out window casings, overhaul burnt lumber and material, cut up portions of floors and general overhauling on second, third and fourth floors of Nos. 727-733, pull down brick walls of No. 695 E. 147th St.....

Total time at work, ..10.. *hours* ..15.. *minutes; on duty,* ..10.. *hours* ..15.. *minutes; out of quarters,* ..10.. *hours* ..32.. *minutes. Department property lost, ... Department property found, ... Department property destroyed, ...*

REMARKS.

...Operated under direction of Chief Croker, Deputy Chief... ...Ahern, Chiefs of Batt. Sloan, King, Acting Chief Roan; returned to quarters by order of Acting Deputy Chief King...

WILLIAM R. CORCORAN,
Foreman, H. & L. Co. No.....29...



FIRE HOUSE DORMITORY—NEW YORK CITY

DETAILS OF POLICE WORK

The Danger of a Policeman's Life—His Conduct in Service and Out—Attitude of the Public—Identification Methods—Reports of Casualties.

BY MAJOR RICHARD SYLVESTER, President the International Association of Chiefs of Police
Condensed from an Address Delivered at the Annual Convention at Hot Springs, Ark.

MAJOR RICHARD SYLVESTER, SUPERINTENDENT OF POLICE, WASHINGTON, D. C.

IT goes without saying that the work of the police is an unusual and continual risk, although there are not continual demonstrations in each locality to keep this truth always apparent to the citizen. It is to be regretted that the risk feature should be out of mind for the reason that riot and turmoil are not at all times in sight. It should be remembered that while peace generally prevails, disorder is not infrequent, when the risk is increased, and it is then that the policeman is applauded if he does well his task; on the other hand, it should be a source for congratulation on the part of the public, if, in the conduct of his part, distress and disaster are averted. Close attention to duty, coupled with intelligent and fair application to the subject in controversy, though not always attracting public attention, often obviates the adoption of more heroic measures and is worthy of emulation and appreciation. It often carries with it decided risk.

Looking into the police activity of five hundred cities in the United States for the year which closed the first of January last, sixty-nine of them, exclusive of New York, report fourteen members of the combined forces killed and one thousand and seventy-one injured in line of duty.

In that great business center, Chicago, four of these lost their lives and three hundred and twenty-one were injured, while information from St. Louis and Philadelphia does not disclose casualties of the kind. Cleveland places one member killed and forty injured; Boston, seventy-seven injured; San Francisco, fifty-eight; Louisville, forty-five, and the District of Columbia, one hundred and eight. Other localities furnish statistics which show from one to thirty-three injured.

That the services of the police officer are meeting with growing favor in the public eye is evidenced by the special reports from the several hundred municipalities, wherein it is stated that police pension funds are maintained in forty-four of the sixty-nine corporations which supply the figures of those killed and injured.

When the risk, the exposure to injury and disease that pertain to the life of the police officer, who must apply himself so earnestly and assiduously to his labor in this age, is taken into consideration, a sense of justice and fairness prompts that there should be provided for him every encouragement for a faithful performance of duty—ample compensation, tenure of office during good behavior, and relief in case of injury or disease contracted in the line of duty and for his family in case of his death.

It should not be forgotten that good work on the part of the private of the force reflects credit upon his superior. To secure that it is incumbent upon the latter to have the support of those under him. It behooves him to study their interests as well as his own, and to possess their confidence and respect. Honest, sober, discreet, and firm, but kind, leadership begets the same kind of assistance. The member of the force should not fail to understand that his profession is an honorable one if he chooses to make it so, and that discreet practice and procedure will sooner or later elevate the standing of police forces generally.

HANDLING OF CRIMINALS

While brawn is at times necessary, men should be taught to realize that brains properly applied are far reaching in effectiveness. As time has progressed and enlightenment controls, the criminal is not backward, but keeps pace with conditions, and his overtaking and punishment call for study and skill. On the other hand, public sentiment demands humane handling of the criminal classes in these days, and in order to meet conditions it is proper that the officer of the law should feel that he is not only the instrument of apprehension and arrest, but that he is sufficiently informed to recommend such treatment as circumstances may warrant in that direction. Therefore I believe that a chief who is in touch with those engaged in charities and corrections and prison reform work, while he may not agree with everything that is said and done by them, may find himself more thoroughly equipped if he acquires a knowledge of what is being done through the agency of those organizations.

As to hours of police duty, every community presents a different situation. The aim should be to give the public the greatest amount of protection, but at the same time the requirements should not be such as to call for any more irregularity in meals and sleep than is necessary. Irregularity in these respects produces sickness, if not permanent disability, which burden the pension fund or result in removals, and I feel quite confident that you can get more honest, conscientious and satisfactory service from a policeman in good health than you can from one who is compelled to do duty while ailing or complaining. Better results will follow the energetic transactions of one well man than will accrue from a half dozen sick, partially despondent assistants.

There prevails an impression in many parts of the land that the police officer is always seeking trouble. While he is but human, he should not allow his personal disap-

pointments or grievances to enter into his police work. At least those comprising a properly conducted institution discourage such practice. The policeman's position is that of the representative of the law, wearing the insignia which stands for peace and good order, and as such he should be respected. In line with proper administration the member of the force should be instructed so as to have his thought uppermost in his mind at all times, as should the good citizen.

Bowling, target practice, friendly recreation contests between police and civilian teams, the identification of policemen with civil organizations of a social and charitable nature, all tend to bring about a better understanding and more thorough co-operation between the policemen and citizens. The relationship should be such that when work is well done the officer will receive encouragement from the public and when badly done its criticism, not failing, however, to take into consideration many of the disadvantages which enter into the lot of the policemen. To succeed, the relationship between the officer of the law and the citizen must be cordial; the former must have the support of the latter.

The greatest incentive to this condition is to have the police free from political pull. The first safeguard for the protection of life and property by an agency is that it will be sustained, go undisturbed so long as it exercises its powers honestly, intelligently and earnestly in detail and as a whole.

There are those who are apt to close their eyes against a painful truth, who are loth to believe that within our gates exist organizations of a secret character, whose purpose and acts are inimical to the welfare and existence of the State. Those who compose them are not generally to the manor born, but are the product of foreign climes. They teach no doctrine, they possess no principles, they have no creed, but aim to simply witness destruction. They would pull down the pillars of the temple in order to see them fall and crush those who would construct and systematize. Our liberal laws as to publication and speech have been taken advantage of to encourage them in their work. It has remained for history to repeat itself in cruel assassination to emphasize these conditions.

Prevention of Crime

Crime is, always was and ever will continue to be committed. It was this fact, as I have stated, that prompted society to organize and maintain the police as its agents to prevent its committal and to apprehend in case of commission. The stronger the public institutions with respect to system, adequacy of numbers and integrity, the greater the ability to effect prevention and bring about detection. The application of these qualities invokes the use of modern appliances such as telegraph, telephone and signal facilities, patrol wagon, measuring and photograph instruments.

Aside from the personal acquaintance established and fostered at these conventions between the heads of police institutions the effort has been to better and improve the general system, to enlarge the minds of the masters, to introduce identical improvements in the warfare against crime and to establish a thorough co-operative policy throughout the world. When we look back to the time this association was established a wonderful advancement has been achieved. Indifference has given way to earnest application. On the theory that society generally is benefited by the action of one chief for another the authorities of one locality promptly apprehend, if possible, for the other. Criminal information obtained in the East is communicated to the West, and that had in the North is given to the South, and through the aid of the press and other publications the police machinery of the world is kept in touch.

Advertising information, for and about criminals, has become a valuable adjunct to modern police work, and the members of the press are necessarily our co-laborers. There should be a ready interchange of knowledge and an inviolate confidence. Facts should be used and be readily interchangeable. With this manner of procedure good results will follow.

In the period of our growth the disposition of offenders has caused a great deal of argument, and a modification of the laws relating to the treatment of prisoners has followed. The harsh handling of subjects restrained has largely given way to humane methods. Efforts are made to avoid contamination by separating the juvenile and first offender from hardening influences by the establishing of distinct places of restraint and juvenile courts.

The probation officer occupies a place for the accomplishment of wonderful good for society. The placing of truths before the courts concerning prisoners, their impairments and deficiencies, moral, mental and physical, has enabled the judges to render more nearly correct findings and to more properly adjust penalties. As this practice becomes more general there will follow in time a saving rather than a loss to the government, an elevation rather than a demoralization of countless unfortunates. The whole effort is for the betterment of mankind. It should not be inferred that the criminal, degenerate and case beyond redemption is not to have accorded him his full deserts.

It is very gratifying to observe that those charged with the management of municipal affairs have been giving earnest thought to these matters and that such attention has been productive of good results.

Identification of Criminals

There has been encouraging growth in the adoption, by various departments, of means for the identification of criminals. The efforts made by this Association and the departments of the larger cities have resulted in the existence of an extended and valuable system and the maintenance of a Bureau of Criminal Identification in Washington by a co-operative private support.

There is and will continue to be a difference of opinion as to the worth of the two prevailing means of identification now in use, but all will agree that two are better than one. The photograph considered in connection with the Bertillon or Finger Print method should not be dispensed with, as it is, of all others, a ready process of recognition if the details are not too antiquated or produced otherwise

than under natural posture and clothing. The hat on or off in a picture may be misleading.

The measurements, experience shows, may vary in some respects, but that does not detract from their finding of data for identification even when the picture may be faulty. Discrepancies occur through carelessness or insufficient training of operators. Accuracy in every particular is obtained by measuring, recording and noting under the same set rules and action. As a whole the system is good and effectual.

The finger print process serves as an important adjunct. It is cheap, easy of application, capable of ready subdivision and classification and requires no expert but a competent officer except at a bureau of exchange. Where the cost of the Bertillon method would exclude its being adopted, the finger print should be had by all means. It is in use in St. Louis, Leavenworth prison and elsewhere, but not generally. There is no reason, however, why it should not be, and on account of its trifling expense I predict that it will become most extensively used in a few years.

The War Department has had the several methods now in use investigated by a board of competent officers, and I am inclined to the opinion that they will give the finger print system favorable report and adopt it. Desertions from the Army, as you know, is one of the important difficulties to be reduced, and apprehension by the police is frequently invoked. Identification by card would, no doubt, be of assistance, and, vice versa, there are those wanted for crimes who often endeavor to hide their identity by enlistment. Consultation at a bureau by card would enable identification to be made.

I have gone over the subject with those interested under the government, and it is the desire to bring about a co-operation with the Police National Bureau of Criminal Identification, which I think will in the near future be accomplished.

The Superintendent of our Bureau is giving the finger print method attention, and when we can secure a general exchange of measurements additional protective facilities will have been established throughout the country for the prevention and detection of crime. The two systems should be maintained, if not both, then one or the other, and I urge it upon all police chiefs to give this feature close attention with a view to its general adoption by all departments.

Before closing I desire to invite your attention to an important feature which has claimed my attention. For a number of years departments have been issuing annual reports, but many of them are printed without comment or reference to police administration. I am of the opinion that if the heads of the departments would, in a measure, go into details explanatory of their operations, it would add materially to the interest of all.

It is also important that these reports should give the title and rank of all officers employed in any establishment, with statement of compensation, and this leads up to another matter which concerns our welfare, and that is the adoption, as near as possible, of uniform tabulated reports of work accomplished during the year. While different laws prevail in different communities, this Association should be authorized to provide a general form for report of arrests for greater crimes in order that all may be consolidated; and a statement of the number of policemen killed or injured would materially aid the system at large. Reports as to casualties are now compiled in a number of large cities.

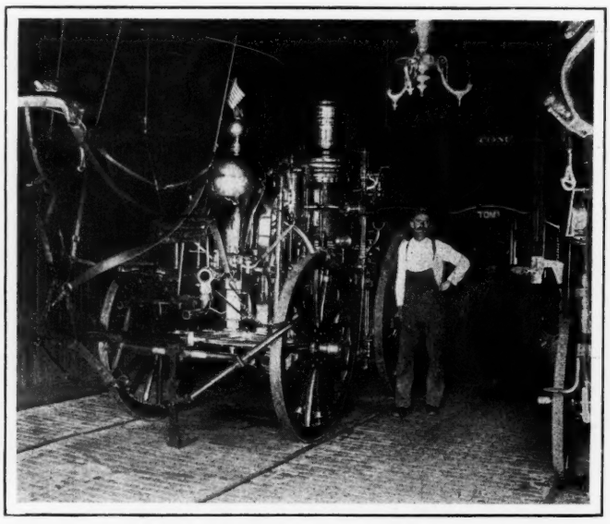
VOLUNTEER FIRE DEPARTMENT

At Alexandria, Va., a Decided Success—Organized in 827 Columbia Company a Prize Winner—Interesting Facts and Figures

The city of Alexandria, Va., boasts of having one of the finest volunteer Fire Departments in the South. For five consecutive years the Columbia Engine Company has taken the first prize, with a record of drawing water 13 feet and throwing a stream 180 feet in 8 minutes and ten seconds from a cold engine. This engine is an Amoskeag single pump, built 44 years ago for the Philadelphia Fire Department and purchased when the old Volunteer Department went out of existence. It was recently rebuilt by the American Fire Engine Company, and is a very efficient machine.

The department numbers 200 men, and is equipped with the engine just described, together with another Amoskeag double-pump engine, two hose wagons and a hook and ladder truck. A third engine has just been ordered, a 1-inch class, 4-inch size American La France, of Elmira, N. Y., costing $4,200.

The department has been in existence since 1827, when the old Hydraulion Company was organized, being the first steam fire engine company in the State. Relief Company was next organized in 1867, and Columbia in 1871. The Reliance succeeded the Hydraulion in 1903. The water pressure at plugs is about 25 pounds, necessitating a pump at all times. In his report for the fiscal year ended July 31, Chief Pettey complimented the workers of the



ALEXANDRIA, VA., FIRE DEPARTMENT
(Columbia Engine House)

department for diligence and efficiency. During the year the Fire Department was called out seventy times, the whole department was in action fourteen times, a portion was in action twenty-five times, and thirty-one times it was not necessary for the engines to go into action. The average time of answering calls was three minutes. This is considered very good time, especially when the fact is taken into consideration that the city is not possessed of smooth paved streets, of which other cities can boast.

The following interesting facts concerning the city's Fire Department are taken from a recent report:

Reliance Steam Fire Engine Company

Salary of Engineer	$785.00
Salary of engine driver	570.00
Salary of wagon driver	540.00
Pay of extra engineer	21.66
Pay of extra driver	36.36
Machinist and wheelwright work on engine and apparatus	27.77
Gas fixtures	2.55
Bran, corn, oats, hay, etc	346.35
Harness and repairing	6.90
Brooms, oil, waste, soap, etc	31.97
Gong, $20.00; freight, 63 cents	20.63
Wood, $5.25; coal, $74.25	79.50
Water rent	17.00
Garden hose	9.00
Horseshoeing	50.25
Ice, 1904	13.80
Six rubber coats	24.00
Six pairs rubber boots	27.00
Painting and repairing reel	25.00
Steel horse collar	18.75
Seven hundred feet hose	593.25
Ring and coupling	3.70
Washington Post	7.00
Rope, $3.50; extinguisher, $5.00	8.50
Veterinary to April, 1905	50.00
One-third cost machine clippers	6.79
One-half cost expansion tool for coupling	5.00
Hardware and mop	8.60
Hand loop for pipe	1.50
Electric trip	9.65
	$3,347.48

Columbia Steam Fire Engine Company

Salary of engineer	$780.00
Salary of engine driver	570.00
Salary of wagon driver	540.00
Pay of extra engineer	21.67
Pay of extra driver	31.95
Machinist and wheelwright work on engine and apparatus	8.27
Bran, corn, oats, hay, etc	335.01
Harness and repairing	31.86
Brooms, oil, waste, soap, etc	46.68
Three hundred feet hose	254.25
Medicine	9.90
Garden Hose	12.40
Ice, 1904	13.80
Wood, $10.50; coal, $69.05	79.55
Water rent	6.00
Horseshoeing	40.73
Washington Post	7.00
Veterinary to April 1, 1905	50.00
Tinware, $2.00; extinguisher, $5.00	7.00
One-third cost machine clippers	6.79
One-half cost expansion tools for coupling	5.00
Painting and ornamenting engine wheels	38.95
Gate valve	23.75
Rings for couplings	3.70
Ten pairs rubber boots	32.50
Ten rubber coats	27.50
	$2,984.26

Relief Hook and Ladder Company

Salary of driver	$630.00
Pay of extra driver	35.00
Bran, corn, oats, hay, etc	159.53
Horseshoeing	37.09
Soap, brooms, oil, etc	7.60
Repairing harness	2.65
Draw brake	35.00
Repairing and setting wheels	13.68
Repairing axle	8.00
Wheelwright work	3.25
Medicines	5.05
Water rent	9.00
One-third cost machine clippers	6.80
Extinguisher, $3.00; coal, $28.00	31.00
Gas fixtures, $2.50; tinware, $1.85	4.35
Ice, 1904	13.80
Veterinary to April 1, 1904	50.00
	$1,051.80

THE ALEXANDRIA, VA., FIRE DEPARTMENT—ORGANIZED IN 1827
(Showing a Company in Uniform)

THE POLICE FUNCTION

And Its Relation to the Individual — Promotes the General Welfare by Restraint and Compulsion—Administration and Jurisdiction

By LEONHARD FELIX FULD, M.A., LL.B.

"Salus Populi suprema lex esto."

THE police function to-day is that function of the government which protects its existence against unlawful attack and promotes the welfare of the people by means of restraint and compulsion, with a view to obtaining the greatest good for the greatest number. Since every government must have the power to protect itself, the police function is a sovereign power possessed by every governmental entity. Thus, in the United States, it is exercised concurrently by the national government, the government of the commonwealths, and the municipalities. The word *police* is of Greek origin, and in ancient Greece it included the entire public activity of the city state. With the development of a realm of individual immunity guaranteed by a constitution, the sphere of police activity was gradually narrowed, until to-day, in Germany, it is used to include only the internal governmental administration, exclusive of the military, financial and judicial functions. In the United States the conception of the police function is similar to that of modern Germany, but with the limitation that in Germany the police interferes more in the everyday affairs of the individual, while in the United States the constitutional limitations upon governmental power narrow the sphere of governmental action.

POLICE POWER

The police function is so important that it is exercised by each of the three governmental authorities, the legislative, the judicial and the administrative. The legislative department of the government exercises the police function in enacting police statutes and ordinances—certain forms of conduct which the individual must follow. This legislative exercise of the police function is commonly called the "police power." In the United States, where the constitutional limitations upon the exercise of governmental power are best developed, this police power extends in three directions. It aims first to promote the primary social interests by securing to the individual peace and security from crime, safety and health, public order and comfort, public morality by the regulation of gambling, intoxicating liquors, and vice, and public security by the care of the dependent classes. Secondly, it promotes the economic interests of the individual by protecting him against fraud and combinations of capital, by protecting laborers, by regulating the use of property and the conduct of business affected with a public interest, and by enforcing provisions for compulsory benefits. And finally, the police power protects the rights of individuals to personal, religious, political and economic equality, the right of the individual to hold his property free from appropriation, injury and destruction, and the right of the individual to equality of status. Each of these functions of the police power is subject to constitutional limitations upon governmental activity, based principally upon judicial interpretations of the Fourteenth Amendment to the Federal Constitution. In European countries all but the most elementary of these constitutional limitations are either absent or unenforcible, and the government accordingly regulates in a paternal manner subjects which with us are left to private initiative.

POLICE JUSTICES

The judicial exercise of the police function is in the hands of police justices, whose duty it is to deal summarily with offenders against police regulations. The jurisdiction of these police justices is accordingly criminal, and their principal function is to examine and commit, pending action by the grand jury or prosecuting attorney, those accused of serious crime, and to punish or free after a hearing those charged with minor offenses. In practice, however, the duties of these police justices are much greater. A large proportion of all the civil litigation of the country is upon one pretext or another, brought before these justices and determined in the guise of a criminal proceeding. Nearly all of the petty civil disputes of our tenement dwellers are determined by these justices as cases of breach of the peace or assault. While the ordinary rules of law and procedure are followed in these courts, yet because of the summary character of the work it becomes necessary to give these justices a very wide discretion—a wider discretion than that enjoyed by any other judicial officer. The great majority of the people know no judge except these police justices, and because of the ignorance and want of familiarity with our institutions displayed by the litigants in these courts, it becomes very easy for an unscrupulous justice to become oppressive, and even corrupt.

PREVENTIVE FUNCTION

Having treated in this somewhat summary manner the legislative and the judicial function of the police, we come next to the administrative function of this power, which will form the subject of this paper. The administrative police has two important functions—a preventive function and a punitive function. This distinction is clearly made by the French, but not so clearly drawn in Germany, where the police jurisdiction extends to every governmental endeavor for the public welfare, as distinguished from some of the state activities, aimed merely at the continued existence of the State. In America also these two functions are seldom differentiated, although logically the duties of the police easily lend themselves to such a classification. Of these two functions of the administrative police the preventive function is certainly the more important, since if evil be prevented and the commission of crime hindered, there will be no criminals for

the punitive arm of the police service to ferret out and apprehend. The preventive police seeks to prevent the happening of evil by maintaining a regular patrol of the streets day and night, by enforcing the city ordinances, most of which aim to prevent accidents and protect the health of the people, and by the regulation of street traffic for the same purpose. These are the means employed to protect the law-abiding citizen; but the police must also prevent the criminal from following his chosen calling, if possible. With this end in view, the German and the French police keep a careful record of each inhabitant which shows his correct name, occupation and character. Prompt notice of new arrivals must be given to the police by landlords and hotel-keepers, and a failure to notify the police before leaving the city, may make the offender, if a citizen of the country, subject to summary arrest for identification anywhere in the country. The English-speaking people have such a great love of liberty that a system of registration of all the inhabitants of the country, as is maintained in Germany and France, is impracticable. Yet even in England convicted criminals are obliged to keep the Home Secretary constantly informed of their whereabouts and behavior, after being released from prison. In America, on the other hand, we believe in giving the released convict an unfettered opportunity to start life anew, even though we know from experience that at least seventy-five out of every one hundred will be back in prison in the course of a few years. Accordingly, we have no system for the registration of inhabitants, nor even for the registration of ex-convicts. In isolated cases, it is true, police officers may keep unofficial records of known criminals, and prison wardens and police chiefs may even, as a matter of courtesy, inform the chief of police of a city when they receive knowledge that a criminal is bound for that particular city, but such occurrences, though not infrequent, are extra-legal.

Census and Identification

Closely related to the subject of registration is the subject of the census. Wherever the police keep a register of all the inhabitants, it becomes an easy task for them to compile the census, and this work is generally performed by the German and French police annually. Even in countries in which the police do not maintain a registration system, they take the census at stated intervals. Indeed this seems to be one of the most primitive functions of the police, as we find this duty performed by the police officials since time immemorial in China and Arabia. In the United States the important decennial census is taken by the national government, but the individual states often provide for an intercensal census for state purposes, and the police frequently attend to these enumerations. Another subject closely connected with police registration is the maintenance of a bureau of criminal identification. All countries that maintain a secret police for the purpose of discovering criminals who plot against the continued existence of the government, maintain a central bureau of criminal identification as an adjunct of such secret police service. This is true particularly of the countries of continental Europe. But even in countries which do maintain a secret police service the efficiency of the police administration requires that a system of criminal identification be adopted. England has an excellent central identification bureau connected with the Home Secretary's office. In the United States, on the other hand, the situation is peculiar. Each municipality has its own police force, and most of the larger cities maintain a criminal identification bureau, commonly called a "Rogue's Gallery." Those bureaus of the national government, which are engaged in criminal or quasi-criminal work, also maintain a criminal identification bureau of their own. The Division of the Secret Service of the office of the Secretary of the Treasury, the Division of the Chief Postoffice Inspector of the office of the Postmaster General and the Bureau of Immigration of the Department of Commerce and Labor, have the best collections. These municipal and federal bureaus are moreover, generally open to police officers of other cities as a matter of professional courtesy. The International Association of the Chiefs of Police of America also maintains a criminal identification bureau supported by the voluntary annual contributions of the police chiefs of the various cities who are members of this association, and the same organization is advocating legislation for the establishment and maintenance of such a bureau by the national government. Three systems of criminal identification are in use to-day, either separately or concurrently—photography, anthropometrical measurements, and finger-print records.

Punitive Function

If we borrow a metaphor from the domain of medicine and call the preventive function of the police the hygiene of police administration, then we may refer to the punitive function of the administrative police as the therapeutics of police administration. It is the duty of the punitive branch of the police force to ferret out criminals and assist the courts in convicting them. This work is done by detective officers specially selected for their ability to run down criminals, by the regular policeman who happens to arrest a criminal in the line of duty, and must then go to court to give his evidence, and by policemen who are specially detailed to maintain order in the various criminal and civil courts. It has been the experience of the world that the efficiency of the detective force varies inversely as the freedom of the people. Thus in Russia and in France the criminal investigation department is the most efficient; in the United States, least efficient. While causes other than the personal liberty of the individual doubtless contribute to this result, yet it is easily apparent that the most effective detective work requires a constant interference with personal liberty which is repugnant to American ideas.

Historically the police is the child of the military. On the continent of Europe the military garrisons sta-

tioned near the large cities were the police force of the cities. The soldiers of the army at first had exclusive charge of the maintenance of order in the cities; later a detail of soldiers from the garrison formed a special police force, which was assisted only in cases of emergency or serious tumult by the entire garrison. Such a system puts a tremendous power in the hands of the central governmental authorities. In America the police force is quite generally a local city force and the military a State force composed of local units, but subject to State control. The local police must cope with all municipal disorders, trivial or great, and the military can be called upon only in cases of emergency, and in most of the commonwealths only upon the written request of the Mayor of the city or the Sheriff of the county, and the written approval of the Governor of the State. Both of these officials have the power to refuse to call out the military, if, in the exercise of their official discretion, they think it inadvisable to do so, and such an exercise of discretion is neither reviewable by the courts, nor in most cases subject to any interference by the President of the United States. Nor is dread of the military portrayed by these provisions of our American law purely sentimental. The military not only frequently becomes an agency for oppression, but it is peculiarly ill-adapted to police work. It either does too little or it does too much. The policeman's baton is known to the lawbreaker, and at its approach the rioter generally retreats; the rifle and bayonet on the other hand, are strange, and to a certain extent fascinating, and the rioter seldom believes that they will be used in earnest. A policeman can dash into a mob and arrest the ringleader, whereupon the mob suffering from the loss of a leader will in most cases disperse; a soldier cannot break ranks and the arrest of a ringleader is rendered more difficult. And finally, if violence must be used, the baton of the policeman merely makes the rioter feel extremely uncomfortable for a few days, which causes him to remain at home and accomplishes the very purpose aimed at; the rifle of the soldier, on the other hand, inflicts a very serious and frequently even a fatal wound, thus causing bitter resentment on the part of the murdered man's relatives and friends, and urging them on to a continued defiance of the law. Thus a small riot may, by the action of the military, often be turned into a bloody rebellion.

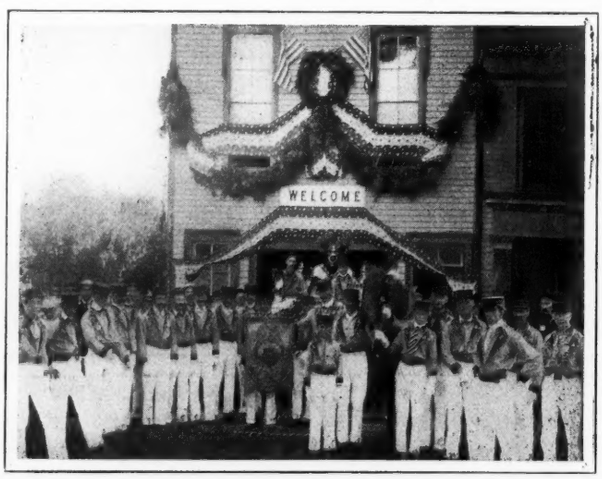
In countries in which the police are officers of the courts, as in London in the eighteenth century, or in China to-day, and in countries in which the lower courts are a part of the police system, as in Russia, the liberty of the individual is almost completely at the mercy of the police. In China the court does not like to discredit its servant, the policeman, and in Russia it hardly dares to discredit its master. But in modern England and America the police and the judiciary are independent and coordinate. Yet since it is the province of the courts in America to protect the liberty of the individual which the police, in the performance of their duties, frequently attack, either accidentally or intentionally, the courts are to this extent superior to the police. Nor is an inordinate desire for power the only cause of the abuse of the police power; a laudable zeal on the part of the police to do their duty may work as great havoc to personal liberty. The occurrence of a series of murders may spur the police on to make an arrest at all hazards, even though the suspect be innocent, and in such a case the judiciary must step in to protect the individual from an abuse of the police power.

WATERFORD'S OLD ENGINE

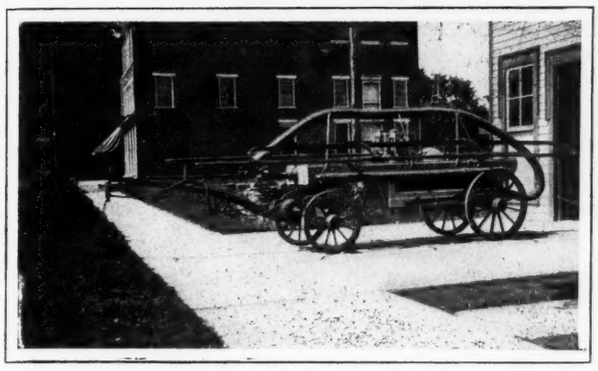
Operated by a Volunteer Department — Annual Expense Small—Fire Fighting in Pennsylvania Town—Methods and Apparatus

ONE of the first fire engines built for the city of Buffalo is now in use in the village of Waterford, Pa. After serving an extended apprenticeship in Buffalo, it settled down to creditable service in the city of Erie, from which place it was promoted thirty years ago to be the chief and only fire engine of the village of its adoption, where there is a volunteer Fire Department of 30 men. The engine is attended by a hose cart carrying five thousand feet of two and one-half inch hose, and it is still able to cope with all ordinary fires. It consists of two single-acting force pumps, operated by a lever on each side, mounted on a substantial hand truck; and with ten men at each side lever the engine can deliver an inch stream through half a mile of hose with sufficient pressure to cover the highest building in the town.

The village is an independent borough, with a population of eight hundred and enjoys a historical reputation, being located on the site of Fort Le Beoff, and it was visited by Washington during the French and Indian war. The borough owns the Fire Department building, which is 20 x 60 feet, with a hose tower. Under the entire building extends a ten-foot cistern, fed from a spring, forming an ample and convenient reservoir. In case of fire the bell in the tower signals the depart-



THE EAGLE HOSE COMPANY NO. 1 —WATERFORD, PA.



FIRE APPARATUS —WATERFORD, PA.

ment, the engine company draws the fire pump outside the building and drops the suction pipe into the cistern. The hose company lays the hose from the pump to the fire, the pump is started without any delay and the fire is soon under control.

The whole expense of maintenance and operation is, of course, paid by the borough, but it does not average more than fifty dollars a year. The illustrations show the fire engine outside the engine house ready for service; also the fire company on dress parade. The whole illustrates apparatus and methods which were common twenty-five to fifty years ago, and are still capable of giving fire protection to the smaller villages.

DYNAMITING TO FIGHT FIRE

Some San Francisco Experiences—Views of General Funston and Others—Problems Yet Unsolved—Losses and Insurance—Liability

By ROY HARRISON DANFORTH

Between midnight and 4 o'clock on Friday, April 20, the San Francisco fire was stopped on the west at Van Ness avenue, a street 120 feet wide, running north and south through about the middle of the city. In the afternoon Mayor Eugene E. Schmitz had announced that what was left east of Van Ness would be dynamited in the evening in spite of the protests that had been made by property owners. It was done, and the flames were halted. Whether it was the use of the dynamite that ended the fire there, or the width of the street, is a question that is still being discussed. Also of considerable interest is the employment of the explosive prior to that time in lower sections of the city and its complete failure to put an end to the fire's progress. It is much to be regretted that there was not more water with which to fight the fire, if for no other reason, then because of its having made impossible the settling of a question that has divided fire-fighters ever since gunpowder was invented:—What is its utility in stopping flames?

On the first day of the San Francisco fire there was broached a proposition to blow down the entire square bounded by Montgomery, Sutter, Sansome and Bush streets. It failed for the reason that there was not enough dynamite in the city to raze even the hotel that was in that block. Only one thing was proved during the whole of the dynamiting on the 18th; viz., the impossibility of dynamiting steel-frame buildings. The next day, Thursday, plans were continually proposed to raze whole blocks in the path of the fire, but one by one they were abandoned. In most cases, before the dynamite crews got to work, the fire was upon them. Almost in every case while the men were laying their fuses at one side of the block, the other side was already in flames. When buildings were razed it was impossible to keep the fire from jumping over them. The reason for this impossibility was certainly the lack of water. Had this been obtainable the conflagration would undoubtedly have been checked.

The Lack of Water

It was this lack of water which makes it so difficult to draw lessons from the San Francisco fire on the utility of dynamite. That the flames could have been stopped had there been sufficient water to cool the ruins left by the powder crews is thought by many who were in a position to judge to be incontestable. But this supply there was not. Practically every conduit that supplied the fire hydrants was shattered, and for a time on the morning of the 18th the department was almost demoralized. When water was at last procured it was by relaying it through fire engines from the water front, and by that time the flames had almost burned themselves out.

The interviews which follow were procured from R. S. Chapman, for years connected with the Underwriters' Fire Patrol; Acting Chief of the Fire Department, John Dougherty, and General Frederick Funston, commanding the Department of the Pacific, from whose headquarters at the Presidio were sent the troops that commanded the city for a while and from whose ranks were picked the dynamiting crews. The first named was engaged by the city to accompany the Fire Chief to conflagrations, because of his intimate knowledge of the interior of buildings. He had a wonderful memory of the structural interiors, having inspected nearly all of any importance. To the interviewer he had the following to say:

"The theory of dynamiting is that of getting the fire down low enough to minimize the danger or tendency to communicate to buildings at some distance. It has always been figured by experts that, when a fire assumes proportions beyond the control of the ordinary fire fighting facilities of a city, a row of buildings in the pathway of the flames should be razed and allowed to burn, fire thus being made to fight fire. This plan always presupposes that there shall be a water supply. But in our case we had no water and the dynamiting at times only seemed to spread the fire, since it reduced frame buildings to kindling wood, which became involved almost at once and burned all the more fiercely. Without a drop of water to wet down adjacent buildings, the flames would jump a street as if no street intervened. The military did the dynamiting understandingly and without thought of personal danger. But there was no water with which to take care of the ruins.

"To anyone who understands, the showing made by the Fire Department was a wonderful one, fighting as they

did against such overwhelming odds. When the stand was made at Van Ness avenue, that saved the Western Addition, the men had been fighting for thirty-six hours without cessation. Water was being pumped from the bay by a Government tug lying near Fort Mason, three fire engines being relayed to bring the water to the scene of the stand. When this supply was obtained, the buildings east of Van Ness avenue were razed with dynamite or fired by the firemen while the water was used to keep the flames from leaping the avenue. Then was the value of back-firing demonstrated. It saved the Western Addition."

Fire Chief Sullivan received injuries at the time of the earthquake that rendered him unconscious. In this condition he remained until his death came, and he never, therefore, had a hand in fighting the fire. John Dougherty took his place as soon as he learned that his chief had been killed, and was at the head of the department throughout the conflagration. This is what he says:

"Dynamiting can be made practical when it is done with system and expedition by people who understand handling it and when there is some water with which to take care of the buildings it is designed to protect. When a fire is seen to be beyond control, preparations should be made for a stand in advance of the flames. Lines of hose should be laid and every preparation made before setting off the explosive. Then a row of buildings should be blown down by one crew while another takes care of the buildings it is designed to protect.

"Most of the dynamiting in San Francisco's recent fire was not a fair test of the efficacy of the scheme. We had absolutely no water. Ordinarily the water thrown into a building, the complete destruction of which is certain, cools the ruins to some extent, but in this case the heat was so intense that buildings a long distance from the fire were ignited. Dynamiting is all right, but there must be water to accompany it."

General Funston directed and even helped the crew which did some of the earlier dynamiting in the downtown section. His view of the explosive's efficacy is given as follows:

General Funston's Views

"The question still remains a debatable one whether it is easier to keep the fire from spreading over the ruins of a building demolished by dynamite than over the same building before it is blown down. It may be easier to wet down a ruin, as it is possible to wet it through and through, while a standing house can be wet only on the outside. But if there is water supply enough to do that, then there is little use for dynamite.

"In fact, the whole problem of the use of dynamite in stopping a big fire is as much a problem as it was a month ago. To blow out two blocks and back fire, using water to keep the flames in check, would be a fine thing if you knew just how far the fire was going to burn if you did not blast at all. If we had known that the fire was going to burn to Van Ness it might have been done Wednesday morning, say, at Powell street (eight blocks east of Van Ness). But if anyone had proposed it at the time he would have been laughed at. If gun cotton had been brought over from Mare Island in sufficient quantities to do it and the flames had stopped when they came to the back fire, there would still have been the idea that it was unnecessary and that the fire would have stopped there anyway."

There is one more interesting point that may be taken up in this connection, and that is the liability of insurance companies for the amount of policies on buildings which are blown up by dynamite before the flames reach them. This, of course, is a matter that will undoubtedly have more than one appearance in the near future before the courts, and what they will hold can be only conjectural now. The following opinion was given by E. Myron Wolfe, State Commissioner of Insurance of California:

"In the Encyclopedia of Law the general principle is laid down that when insured property is destroyed at the instance of public authorities to prevent a spread of the conflagration, the insurer is liable for the loss. A case directly in point is entitled, 'The City Fire Insurance Company of New York vs. J. and H. P. Corlies,' reported in Vol. XXI. of Wendell's reports. In that case the liability of an insurance company for loss sustained by a dynamited building is clearly enunciated. A destruction of merchandise insured, by the blowing up with powder of a building in which it was stored, under the direction of a chief magistrate of a city, to prevent the spread of a conflagration, was held to be a peril insured against in a policy against fire, and the insurers adjudged liable for the loss where it appeared that the fire would have destroyed the building had it not been blown down.

"On this showing and others I base my opinion that the insurance companies will have to pay losses on dynamited buildings."

LAYING DUST ON ENGLISH ROADS

According to John L. Griffith, U. S. Consul at Liverpool, tests of all kinds looking to laying the dust are being conducted on English roads. Petroleum, creosote oil, both cold and hot, and both neat and mixed with resin, tallow, and pitch, separately or in combination, coal-tar waste oil, Texas crude petroleum, and calcium-chloride solution, all were tried. Of the oils, the Texas oil gave the most lasting results, coal-tar waste was cheaper and slightly better than creosote; creosote and resin mixed made the cleanest and whitest appearing road; ordinary petroleum was of little use. Oiling wood pavements kept down the dust, but made them slippery. Calcium chloride was dissolved in water and sprinkled over macadam. It seemed to absorb moisture from the atmosphere for three weeks after application, binding the dust particles together and preventing their being blown about. During wet weather there was a tendency for the surface to work off in layers, but it quickly dried and set hard. The cost of sprinkling with water for fourteen days would have been from two to four times the cost of the calcium chloride treatment, which was effective for that time, the chloride costing $7.29 per ton at the chemical works.

STATISTICS CONCERNING MUNICIPAL BONDS

Their Market Value in the Ohio Valley—Debt Obligations and Assessed Valuations—Financial Standing of Various Cities—Details of Bond Issues—Comparative Facts and Figures

STATISTICS CONCERNING MUNICIPAL BONDS SOLD DURING AUGUST, 1906

City and State Arranged According to Population	Amount	Rate	Average Time to Run, Years	Price	Income Basis	Per Capita Debt Obligations		True Valuation of Assessable Property
						Total	Less Sinking Fund Assets	
Cincinnati, O.	$865,000	3.65	20–40	$100.00	3.65	$110.00	$93.02	$373,566,600
" "	30,500	3.65	20–40	100.283	3.60	.....	.....	.....
Indianapolis, Ind.	300,000	3.5	30	100.469	3.45	23.29	23.28	206,584,600
Toledo, O.	80,000	4.	20	100.00	4.00	51.87	44.40	165,914,000
Columbus, O.	250,000	4.	40	100.51	3.95	84.89	49.29	138,464,000
Youngstown, O.	17,000	5.	6½	105.575	4.04	23.20	20.79	48,111,000
" "	4,865	5.	13	101.777	4.37	.....	.....	.....
" "	8,700	5.	4	102.638	4.27	.....	.....	.....
" "	9,350	5.	6½	105.084	4.13	.....	.....	.....
Covington, Ky.	4,191	5.	5½	105.130	3.95	47.46	47.06	30,697,000
South Bend, Ind.	25,000	4.	20	107.000	3.51	24.66	24.66	29,038,800
Springfield, O.	15,000	4.	12	101.333	3.80	29.85	28.89	26,031,900
Canton, O.	2,200	5	5½	100.00	5.00	50.21	49.45	27,135,000
Lexington, Ky.	25, 000	4	40	100.420	3.74	.....	.....	.....
Hamilton, O.	75,000	4.5	5½	102.323	4.02	.....	.....	.....
	55,000	4	15	101.130	3.90	.....	.....	.....
	25,000	4	15	100.500	3.95	.....	.....	.....
New Albany, Ind.	9,000	5	3	102.220	4.20	.....	15.43	10,732,000
Mansfield, O.	4,000	5	1	100.500	4.48	.....	21.43	18,031,310
Ashtabula, O.	19,000	5	5	104.047	4.23	.....	10.85	9,827,000
Massillon, O.	17,700	4.5	3	100.00	4.50	.....	14.63	9,324,800
Tiffin, O.	44,000	4	15	100.375	3.96	.....	57.31	12,002,000
Bellaire, O.	1,950	6	5½	102.770	5.41	.....	25.07	8,706,000
Middletown, O.	1,584	4	5	100.00	4.00	.....	33.35	8,445,000
Elyria, O.	50,000	4	21	100.675	3.95	.....	50.71	9,046,000
Fremont, O.	8,800	4	5½	100.068	3.98	.....	31.31	7,542,000
Wellston, O.	11,000	4	6	100.200	3.96	.....	16.88	4,711,000
	3,000	4½	1½	100.833	4.30	.....	.....	.....
Delaware, O.	15,000	5	5½	104.273	4.12			
Norwalk, O.	15,000	4	5½	100.00	4.00			
Mt. Vernon, O.	30,000	4	10½	100.450	3.94			
	1,900	5	5½	104.474	4.00			
Bucyrus, O.	230,000	4	4	100.056	3.98			
Norwood, O.	9,700	4	6	100.075	3.77			
Coshockton, O.	20,000	4	20–25	101.000	3.92			
	17,000	4	5½	102.156	4.10			
Greenville, O.	26,500	4	6½	102.365	4.10			
Shelby, O.	23,345	4	3	100.042	3.98			
Ashland, O.	3,900	4	.....	100.00	4.00			
	6,000	5	5½	106.568	3.67			
Garrett, Ind.	8,000	5	5½	106.023	3.77			
Dennison, O.	22,000	5	6½	106.478	3.97			
Bryan, O.	29,000	6	5½	107.770	4.39			
	10,000	5	3	101.114	4.63			

The city of Delaware, Ohio, and those listed below have populations of less than 8,000 each, and consequently reports from them are not included in bulletins of the United States Census Bureau.

The table presented above gives the details of most of the municipal bonds sold during the month of August in Ohio and a few Indiana and Kentucky cities, both the bids accepted and the income basis of the same being tabulated. As a matter of comparison, there are also given the per capita debt obligations, both total and in excess of the sinking funds, and also the true value of the assessable property, these latter figures having been taken from the United States Census reports, the returns being for January 1, 1905. In Ohio municipal bonds are free from taxation. It is undoubtedly realized by most of our readers, and appears from the table, that there are other affecting conditions than those given; but it is generally impossible to tabulate these, and often to even give them definite statement.

STANDARD WIRING SYMBOLS

At a recent meeting of the National Electrical Contractors' Association, a set of symbols and suggestions for wiring plans was adopted as a standard, and their universal use is urged. These were compiled after conference with the architectural and engineering interests of the country, and presumably conflict as little with present use as any which could be devised. It would seem to be self-evident that the use of a common standard of such symbols would prevent much of the confusion and many of the mistakes which a multiplicity of symbol schemes has occasioned in the past. This is in line with the general tendency to standardizing, which is in most cases wholly commendable, and we ask for these a prompt acceptance and use by architects and engineers.

THE CITY BEAUTIFUL

Architecture Plays an Important Part in Its Adornment—Popular Interest Essential—Co-operation a Feature of Success

By W. P. HEYL

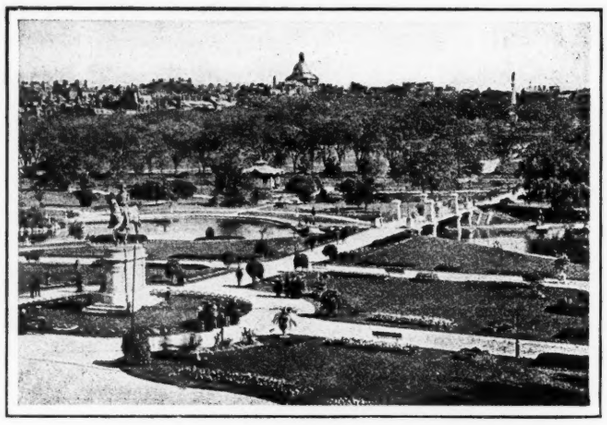
MUCH of a city's beauty is due to agencies other than nature. Architecture plays an important part in the adornment of a city. The locating and grouping of buildings is equally responsible for artistic effect. It is important, also, to arouse the interest of all the people in the beauty of their city as a whole. Foster a spirit of pride in the community, give the people something worthy to be proud of, and that great force, civic consciousness, which is too often dormant, will work wonders.

A beautiful city attracts more good citizens, and nowhere else is co-operation more rich in results, than when the aim is for the city betterment. A Municipal Art Commission is the highest form this tendency achieves; but even before the Art Commission, a civic consciousness is necessary, that the needs of all, "the health, happiness, and sanity" of *all the people* may be served. And this civic movement may be participated in by the humblest. No one knew this better than the late George E. Waring, Jr., who organized the children of the East Side into a Juvenile Aid Society, to assist the White Wings in maintaining cleanliness. The result was doubly beneficial, the sordid places were made clean, and of equal value was the training of the child in civic helpfulness.

Distinguished foreign critics visiting America often comment on the fact that our business men are so taken up with their own personal affairs that they neglect the opportunity to serve the city. That this service is an opportunity as well as a duty is shown by the splendid results of the efforts in this direction of the merchants and professional men of Cleveland, Ohio. Without the training received as members of the Chamber of Commerce, no like number of men could have accomplished so much for their city.

There has been prepared a bill which awaits favorable action of Congress, to appoint a board of artists, whose duty it will be to give opinions on the artistic merits of all public construction and decoration hereafter to be undertaken by the Federal Government. Washington will be one of the first cities to be beautified, as a whole, under the direction of eminent artists. The Pennsylvania Railroad station now building will be one of the most artistic structures on the Continent.

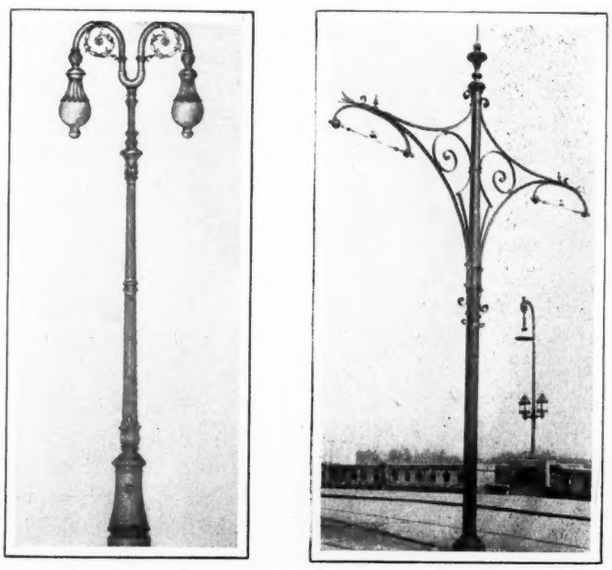
Even in money making an institution may show that sordid finance and art may go hand in hand, for there are few commercial buildings so fittingly designed as the Northern Trust Company's home, in Chicago. Libraries and churches, whose chief influence upon the community is not material, minister much to the city's physical beauty. Architects have robbed hospitals of their grim and melancholy somberness. Monuments and fountains, whose main purpose is ornamental, do or do not contribute to civic art, according as to whether or not they are truly artistic and are harmoniously placed. A public service institution as the Waterworks and its surroundings at Detroit adds to the beauty of that city.



VIEW OF BOSTON COMMON
(Boston, Mass.)

It was due to the perseverance and artistic determination of a young engineer that America adopted from Italy lines of beauty in the construction of so utilitarian an object as an electric light pole. Branch Brook Park, in New Jersey, and Eastman Park, in Rochester, have recognized these as of artistic merit. Another engineer urged Architect Nichols to design the trolley poles which are the crowning embellishment of Washington Bridge.

Beauty does not necessarily take from the usefulness of every-day objects, as witnessed by the humble letter box; by furnishing artistic mail boxes the Government aids in the good work. It is fortunate that the United States has inherited from the time of Colonial Architecture many specimens of pure art in public buildings, and that communities number among their citizens those who insist that its material home should be beautiful.



ARTISTIC DESIGNS OF ELECTRIC LIGHT AND TROLLEY POLES
(Courtesy, Elmer P. Morris Co., New York City)

POLLUTION OF STREAMS

Statutory Restrictions of States—Acts Prohibited and Permitted—Permission to Discharge Sewage—Vested Authorities—Penalties Inflicted.

ONE of the most valuable Water Supply and Irrigation Papers yet published by the U. S. Geological Survey is "A Review of the Laws Forbidding Pollution of Inland Waters in the United States," by Edwin B. Goodell, which has been brought up to the date of August, 1905. While this is an excellently well-arranged and condensed compilation of our State laws on this subject, many will, it is believed, welcome a brief statement, in outline, of the information therein contained.

Speaking generally, jurisdiction over the pollution of waters in the United States is confined to the several States. There is no provision in the Constitution which gives to Congress authority in the premises; partly, no doubt, because at the time of its adoption the great importance of the subject from an inter-State point of view was not thought of. Hence, by the familiar principle that the several States retain full sovereign powers, except so far as such powers are restricted by the National Constitution or expressly delegated thereby to the National Government, the States have full control of this subject.

Mr. Goodell has arranged the States and Territories in three groups or classes:—

I. Those in which the Legislature has confined itself to forbidding the poisoning or pollution of drinking water in certain ways or in certain localities. These are: Rhode Island, Delaware, Georgia, Florida, Alabama, Mississippi, Louisiana, Iowa, Kansas, Nebraska, Kentucky, Arkansas, Oklahoma, Michigan, North Dakota, Idaho.

II. Those in which the importance of pure water for every inhabitant of the State or Territory for drinking and domestic purposes has received legislative recognition. (This class logically includes all States not included in Class I., but inasmuch as certain States have recently adopted stringent and elaborate methods, novel and extraordinary in their character, to restore and protect the purity of their navigable and potable waters, these States have been omitted from Class II. and are treated in a class by themselves.) These are: Maine, Maryland, Virginia, West Virginia, North Carolina, Texas, Ohio, Indiana, Illinois, Tennessee, Missouri, South Dakota, Wyoming, Colorado, New Mexico, Utah, Washington, Oregon, Nevada, California.

III. Those States which have adopted unusual and stringent methods to enforce the right of their citizens to unpolluted natural waters: indicating that the inhabitants of these States have begun to realize the immense harm which the increased pollution of waters, owing to increase of population, is doing to persons and property within their borders. These are: New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Minnesota.

ACTS PROHIBITED

In Class I the acts forbidden are: Depositing dead animals or offensive matter in any spring or reservoir of a city supply (Alabama, Arkansas, Florida, Iowa, Nebraska, Oklahoma); or in or on the banks of any stream (Arkansas, Iowa, Kentucky, Mississippi, Nebraska, North Dakota, Oklahoma, Wisconsin); placing poisonous substances in wells, springs, or reservoirs (Florida, Georgia, Idaho, Michigan, Rhode Island, Wisconsin); placing in any water, matter deleterious to fish and shell fish (Kansas, Rhode Island, Wisconsin); polluting the sources or reservoirs of certain specified city supplies (Delaware, Michigan, Rhode Island).

In Class II the acts forbidden are: Depositing dead animals or offensive matter in any reservoir or spring of a city supply (all but Texas, South Dakota and Wyoming), or in or on the banks of any stream (all but Maine, Maryland, Virginia, North Carolina, Texas); emptying coal tar, petroleum, etc., into lakes and streams (California, Colorado, Missouri, Ohio); discharging sewage into any stream used as a source of public supply (Maine—Sebago Lake only—North Carolina, Oregon, Virginia); discharging sewage into any stream or other body of water (Nevada, New Mexico, Ohio); keeping horses or cattle penned on the banks of streams used as sources of public supply (California, Utah); polluting or obstructing any body of water or sewer so as to render the same unwholesome or offensive (Texas).

The laws included in Class III are much more comprehensive than any of the preceding. The more important (from the sanitarian's point of view) sections of these are abstracted below. The 1905 Act of Pennsylvania is given practically in full, as the latest and typical of the others in this class.

Pennsylvania.—"No person, corporation, or municipality shall place, or permit to be placed, or discharge, or permit to flow into any of the waters of the State, any sewage, except as hereinafter provided. But this act shall not apply to waters pumped or flowing from coal mines or tanneries, nor prevent the discharge of sewage from any public sewer system, owned and maintained by a municipality, provided such sewer system was in operation and was discharging sewage into any waters of the State at the time of the passage of this act. But this exception shall not permit the discharge of sewage from the sewer system which shall be extended subsequent to the passage of this act. For the purpose of this act, sewage shall be defined as any substance that contains any of the waste products, or excrementitious or other discharges from the bodies of human beings or animals."

Connecticut.—"No person shall throw any noxious or harmful substance into . . . any reservoir, or any lake, pond, or stream tributary thereto which is used for supplying the inhabitants of a town, city, or borough with water."

Massachusetts.—"If in its judgment the public health so requires, the State Board of Health shall prohibit the deposit, keeping, or discharge of manure, excrement, garbage, sewage, or any other matter which pollutes or tends to pollute the water of any stream, pond, spring, or water course used by any city, town, or public institution as a source of water supply." Said Board shall not prohibit the use of any structure which was in existence on the eleventh day of June, 1897, unless the Board of Water Commissioners of the complaining city or town, or the complaining water or ice company, files a vote of its Council, selectmen, or company, that it will, at its own expense, make such changes in said structure or its location, as the State Board of Health shall deem expedient; paying all damages caused by such changes. The above not applicable to the Merrimac or Connecticut rivers; nor to so much of the Concord river as lies within the limits of the city of Lowell, nor the area under the control of the Metropolitan Water Board. (These last enforce equally stringent regulations by special legislative authority.)

Minnesota.—Practically the same as Massachusetts, Lake Superior excepted. Existing plants not exempted.

New Hampshire.—Prohibits "placing or leaving in or near" any water used for a public domestic supply "any substance or fluid that may cause the water thereof to become impure or unfit for such purposes;" knowingly and wilfully poisoning, defiling, polluting, or in any way corrupting such water or its sources or tributaries; wastes of lumber manufacture not included, nor other manufacture if four miles distant from intake, except in the cases of certain specified lakes and streams.

New Jersey.—Prohibits "any person, corporation, or municipality to build any sewer or drain or sewerage system from which it is designed that any sewage or other harmful and deleterious matter, solid or liquid, shall flow into any of the waters of this State so as to pollute or render impure said waters, except under such conditions as shall be approved by the State Sewerage Commission: *Provided,* That the provisions of this section shall not be deemed to prohibit the use or extension of existing sewers, drains, or sewerage systems." Also makes it a misdemeanor to throw into any reservoir, pond, or stream, running through or along the border of any city, town, or borough, or whose water is distributed for public use, any carcass, offal, or offensive matter calculated to render water impure or create offensive smells, or cause a water closet to discharge into such water; also sewage, drainage, domestic or factory refuse, excremental or other polluting matter which will impair the quality of water of any stream or body of water "from which is taken, or may be taken, any public supply of water for domestic use." Commissioners of incorporated sewerage and drainage districts (provided for by an Act of 1902) shall prepare plans "for relieving the streams and rivers within the said district from pollution and for preventing the pollution of same," and request legislative authorization for carrying out these plans. (This was done by the Passaic Valley Commission, which planned an intercepting sewer from Passaic to an outlet in New York Bay, with which must be connected all sewers in the district, whether already or to be constructed. Decided unconstitutional in 1905 because of method provided for raising funds.)

New York.—Practically the same as Pennsylvania.

Vermont.—State Board of Health authorized "to prevent the pollution and to secure the sanitary protection of all such waters as are used as sources of water supply." But city, town, village, or company must pay expenses of removing pollutions to their supplies existing at time of enactment, as in Massachusetts. Specifically prohibits discharging sewage or other polluting matter into any stream or body of water used as a source of public supply.

Permission to Discharge Sewage

Pennsylvania.—"Upon application duly made to the Commissioner of Health, by the public authorities having by law the charge of the sewer system of any municipality, the Governor of the State, the Attorney-General and the Commissioner of Health shall consider the case of such a sewer system, otherwise prohibited by this act from discharging sewage into any of the waters of the State, and, whenever it is their unanimous opinion that the general interests of the public health would be subserved thereby, the Commissioner of Health may issue a permit for the discharge of sewage from any such sewer system into any of the waters of the State, and may stipulate in the permit the conditions on which such discharge may be permitted. Such permit, before being operative, shall be recorded in the office of the Recorder of Deeds for the county wherein the outlet of the said sewer system is located. Every such permit for the discharge of sewage from a sewer system shall be revokable, or subject to modification and change, by the Commissioner of Health, on due notice, after an investigation and hearing, and an opportunity for all interested therein to be heard thereon being served on the public authorities of the municipality owning, maintaining or using the sewage system. The length of time after receipt of the notice within which the discharge of sewage shall be discontinued may be stated in the permit, but in no case shall it be less than one year, or exceed two years, and if the length of time is not specified in the permit it shall be one year. On the expiration of the period of time prescribed, after the service of a notice of revocation, modification, or change, from the Commissioner of Health, the right to discharge sewage into any of the waters of the State shall cease and terminate; and the prohibition of this act against such discharge shall be in full force, as though no permit had been granted, but a new permit may thereafter again be granted, as hereinbefore provided. All individuals, private corporations and companies that, at the time of the passage of this act, are discharging sewage into any of the waters of the State may continue to discharge such sewage unless, in the opinion of the Commissioner of Health, the discharge of such sewage may become injurious to the public health. If at any time the Commissioner of Health considers that the discharge of such sewage into any of the waters of the State may become injurious to the public health he may order the discharge of such sewage discontinued."

New York.—Practically the same as Pennsylvania.

Filing Plans with State Board of Health

Pennsylvania.—"It shall be the duty of the public authorities having by law charge of the sewer system of every municipality in the State from which sewage was being discharged into any of the waters of the State at the time of the passage of this act to file with the Commissioner of Health, within four months after the passage of this act, a report of such sewer system, which shall comprise such facts and information as the Commissioner of Health may require. No sewer system shall be exempt from the provisions of this act against the discharge of sewage into the waters of the State for which a satisfactory report shall not be filed with the Commissioner of Health in accordance with this section."

New York.—Same as Pennsylvania.

New Jersey.—Same as Pennsylvania.

Penalties

Pennsylvania.—Municipalities, $500, and $50 per day for continuance. Private parties, $25 and $5 per day, or thirty days, or both.

Connecticut.—Private parties, $100 or thirty days.

Massachusetts.—Private parties, $500 or one year, or both.

New Hampshire.—Private parties, $1,000 or one year.

New Jersey.—Municipalities and private parties, $100, and $100 per week.

New York.—Municipalities, $500, and $50 per day. Private parties, from $100 and $10 per day to $25 and $5 per day, according to offense.

Vermont.—Private parties, $500, or one year, or both.

Bricks Made of Glass

The making of glass bricks for buildings as well as paving has become a recognized European industry. The Germans have carried the invention further than anybody else. In Hamburg glass walls are erected where light is needed, yet where, by police regulations, walls must be both windowless and fireproof. Three firms make such bricks in eastern Germany. These bricks are translucent, admitting light, but permitting no view of the interior.—*Exchange.*

A NEW MOSQUITO KILLER

Marine Hospital Experiments Show Pyrofume to Have Qualities Not Possessed by Sulphur—Dr. J. H. McCormick, Discoverer—Summary

It is claimed in a recent report to the Surgeon-General, National Public Health and Marine Hospital Service, that "Pyrofume will thoroughly destroy mosquitoes, and that it possesses a number of advantages over sulphur.

Pyrofume was discovered by Dr. J. H. McCormick, of Mobile, Ala., and it was at his suggestion and with his co-operation that the following experiments were performed.

Pyrofume is derived by fractional distillation from pine wood as a by-product in the manufacture of turpentine, etc. It is a clear liquid of a straw color; it has a pungent taste and an odor of pine woods. It is harmless to mucous membranes, skin, fabrics, colors, polished metals, and paint work. When heated in a test tube to a temperature of 60° C. (140° F.), a lighted match will cause a flash at the mouth of the tube. If a lighted match be applied for a few seconds to the surface of an open basin containing pyrofume the liquid takes fire.

If pyrofume be boiled in an open basin the fumes will be given off in a limited amount, but if a current of air be directed on the surface of the boiling liquid the fumes rise in a cloud. If a flame be brought into the fumes within a few inches of the surface of the liquid the fumes ignite and the entire surface of the liquid burns with a vigorous blaze, which can be extinguished instantly by dropping a lid or a single layer of cloth over the basin.

Since the fumes as they come off the liquid can be ignited, the question arises whether there is danger from carrying a flame into a room full of fumes. In order to decide this question, a room of 250 cubic feet capacity was charged with the fumes from four times the liquid necesary to kill mosquitoes. A lighted candle was then introduced into the room through a small opening. The fumes did not ignite. The experiment was repeated with ten times and twenty times the amount necessary to kill mosquitoes and the fumes did not take fire.

The fumes are deadly to *Stegomyia fasciata* and *Culex pungens.*

After considerable experimentation on different methods of generation of the fumes, it was finally decided that the best results were obtained by an apparatus consisting of a cylindrical upright retort 6 inches in diameter and 24 inches in height, under which is placed a primus lamp. At the upper end of the retort are an inlet tube and an outlet tube. The outlet tube is 3 inches in diameter and its free end is introduced into the room to be fumigated. The inlet tube is 3 inches in diameter and is attached to a hand blower.

The amount of pyrofume necessary for the cubic contents of the room is put into the retort, the primus lamp is placed beneath it and the blower is started, blowing the fumes from the surface of the liquid through the outlet tube, which is passed beneath a window sash, or through the crack of a door, or a hole in a curtain and so into the room.

Mosquitoes placed in a room containing the fumes from 265 cubic centimeters of pyrofume per 1,000 cubic feet of air space will be killed after one hour. The time of exposure may be diminished one-half by increasing the amount of pyrofume. The time necessary to generate the fumes is very short. A room with a capacity of 5,000 cubic feet can be filled with fumes in five minutes. A room of 53,000 cubic feet capacity was filled with fumes in forty-five minutes. With the apparatus in use, the time required to generate the fumes necessary to kill the mosquitoes in a room is one minute per 1,000 cubic feet of space.

When the fumes are being introduced into a room they are more diffuse at the ceiling than at the floor, but in a few minutes the diffusion is equal.

The room of 53,000 cubic feet above referred to had a ceiling 26 feet in height. Mosquitoes placed on the floor and near the ceiling were found dead at the end of one hour's exposure to the fumes.

Polished silver, brass, copper, steel, nickel, wrought-iron, cast-iron, a great variety of colored fabrics, polished mahogany and oak, and varnished and white painted work were exposed to double the fumes twice the time necessary to kill mosquitoes, namely, to the fumes of 530 cubic centimeters of pyrofume per 1,000 cubic feet of air space for two hours. All were unaltered. The same articles were exposed to the same treatment the day following and remained unchanged.

Bananas in all stages, from ripe to very green, were exposed to the fumes necessary to kill mosquitoes, namely, to the fumes from 265 cubic centimeters of pyrofume for one hour. The fruit was unharmed and was kept under observation for one week; it was not discolored, altered in taste, checked in ripening, or changed in any way. Bananas in all stages of ripeness were exposed to double the fumes twice the time necessary to kill mosquitoes and all the fruit was discolored.

The cost of pyrofume is 75 cents per gallon. Two hundred sixty-five cubic centimeters per 1,000 cubic feet of air space are required. This brings the price of material to 5 cents per 1,000 cubic feet.

Summary

1. As compared with sulphur, pyrofume stands on an equal footing in price.
2. Whereas the Federal regulations require two hours' exposure to sulphur, pyrofume is efficient against mosquitoes in one hour.
3. While sulphur is injurious to metals, fabrics, paint, and colors, pyrofume leaves them unchanged.
4. Pyrofume is suitable for fumigating the engine

rooms and cabins of ships, and for cars and fine residences.

5. In amounts necessary to kill mosquitoes it does not injure bananas.

6. A person can walk about in a room full of fumes and can sleep without discomfort in a room two hours after fumigation.

7. It requires only five minutes to fumigate a large room of 5,000 cubic feet.

8. The fumes are generated outside the room and conducted into it.

FIRE AND POLICE ALARMS

Use of Electricity for Systems in Various Cities—Methods and How Applied—Underground Conduits and Overhead Wires

THE first electric fire alarm system in this country was installed in 1852, but during the next fifteen years only fourteen more systems came into use. During the following fifteen years the number increased to a total of 116, and in the next twenty years the number increased to 764.

The first to enter the business of installing these systems was John N. Gamewell, of South Carolina, who secured the adoption of his system (invented by Channing and Farmer) in Boston in 1852, Philadelphia in 1855, St. Louis in 1858, and New Orleans and Baltimore in 1860. Since then other systems have been devised, those most commonly used being the so-called Gaynor and Speicher systems.

The first electric police patrol system was installed in 1867, and twenty years later there were but 34 in use; but during the next fifteen years this number was increased to 148. The percentages of cities of the various sizes which have adopted the electric fire alarm system is shown in the following table:

ELECTRIC FIRE ALARM SYSTEMS IN THE UNITED STATES

	Total	Cities Having Populations of				
		Over 100,000	50,000 to 100,000	25,000 to 50,000	10,000 to 25,000	Under 10,000
Number of systems.	764	36	37	76	221	394
Percentage of all towns having systems.....	...	92	86	82	75	...
No. of cities using underground conduits.....	83	31	13	13	19	7
Miles of underground conduits.	859	694	65	30	61	9

From this table it appears that 92 per cent. of all cities having a population of over 100,000 have electric fire alarm systems, or 36 out of 39, and that such systems are owned by 86 per cent. of all cities of the next class, 82 per cent. of the next, and 75 per cent. of the next. The number of the smallest cities is indefinite and hence no percentage is given.

Electric police patrol systems are used in 34 cities of more than 100,000 population, 30 cities of between 50,000 and 100,000, 39 cities of between 25,000 and 50,000, 33 cities of between 10,000 and 25,000, and 12 cities of under 10,000. The use of underground conduits for the wires of the above systems is spreading, and such use is now distributed as shown in the following table:

State	Underground Construction of					
	Electric Fire Alarm Systems			Electric Police Patrol Systems		
	No. of Cities	Conduit Mileage	Wire Mileage	No. of Cities	Conduit Mileage	Wire Mileage
United States.	83	859	11,433	57	773	9,011
California.....	3	36	221	2	30	193
Connecticut...	3	38	143	3	33	62
Dist. of Col'bia	1	7	760	1	7	760
Illinois.....	5	65	684	4	58	646
Indiana.....	2	5	58	2	12	58
Iowa.....	...	.....	.....	1	1	2
Kansas.....	...	.....	.....	1	3	27
Maine.....	1	4	17	1	4	16
Maryland.....	1	.....	42	1	50	200
Massachusetts.	17	130	1,463	13	130	583
Michigan.....	6	42	255	2	22	273
Minnesota.....	2	21	315	2	25	358
Missouri.....	1	4	455	2	14	505
Nebraska.....	1	.....	23	1	3	22
New Hamps're	2	5	14	.....	.....	.....
New Jersey...	7	19	156	2	11	86
New York....	8	164	1,380	5	67	584
Ohio.....	6	21	474	4	32	208
Pennsylvania .	4	222	4,353	4	222	4,224
Rhode Island .	2	15	201	2	11	68
Tennessee.....	1	6	45	.....	.....	.....
Texas.....	3	7	26	.....	.....	.....
Vermont.....	1	2	0	.....	.....	.....
Virginia.....	2	6	136	2	6	14
Washington...	1	2	2	1	2	2
Wisconsin.....	3	38	201	1	30	120

NOTES OF CHESTER, PA.

THE city of Chester, Pa., is the oldest in the State, having received a charter from William Penn in 1681. The present population is about 38,000. The assessed valuation is $16,112,636; unassessed, $1,513,520; tax rate, 10 mills; bonded debt, $664,000; sinking fund at date, $91,401.38. The annual budget is about $160,000, including $25,100 for police (29 on the force), $12,800 for Volunteer Fire Department, $7,300 for Department of Highways for cleaning and repairs, $5,700 for gathering garbage and ashes (contracted), $24,500 for electric lights, $7,000 for water rent, and $14,280 for salaries.

The water rent includes payment to the private company of $40 each for 155 fire hydrants. Arc lights, of which there are 225 of 1,200 c.p., cost $84 per year, and the 467 incandescents, 16 c.p., cost $10.50 per year.

There are about 60 miles of water mains, under 80 pounds pressure. The water consumption averages 125 gallons per capita. There are about 20 miles of paved streets, of which 5.27 are sheet and block asphalt, 2.25 are brick and 1.19 are cobble. There are about 27.5 miles of brick and tile sewers.

COMBINATION OF PUBLIC SERVICE CORPORATIONS

Charters Issued by Connecticut Will Merge Gas, Electrical Supply and Street Railway Systems—Capitalization of Companies Unlimited—Rights Granted Unprecedented

By ALTON D. ADAMS

CONNECTICUT chartered corporations with power to issue an unlimited volume of stocks and bonds, and to combine all of the gas, electrical supply and street railway systems in the State, at the late session of the Legislature.

Authority is granted these corporations to erect electric plants and lines in seven of the eight counties of the State; that is in Litchfield, Hartford, Tolland, Windham, New London, New Haven and Fairfield, and to exercise special condemnation and flowage rights. The companies may purchase the plants and franchises of all gas, electric and street railway systems held by others in the State, and may sell their own.

A nominal issue of $5,300,000 in the par value of capital stock may be made by the six corporations, but this may be indefinitely increased. These stocks must be fully paid for in cash or property, but the directors of each corporation may receive property and franchises at any valuation they see fit. Five of the six corporations are authorized to issue bonds of a total par value of $3,625,000, and to secure these bonds by mortgages of their property and franchises. No limitation is put on the prices at which these bonds may be sold.

STERLING POWER COMPANY

The Sterling Power Company is incorporated to develop electrical energy in the towns of Sterling, Plainfield, Killingly and Brooklyn, and to transmit this energy along their public ways. Within the towns named, the Sterling Company may sell energy only to the People's Light and Power Company, a corporation now operating in Killingly, but it may deliver energy at the boundaries of the towns to those who wish to use it outside of that territory. Stocks may be purchased by the company. In par value the capital stock of this company is fixed at $10,000 as a minimum and $500,000 as a maximum. Bonds of the company may be issued to an amount not exceeding three-fourths of its fully-paid capital stock, and these bonds may be secured by a mortgage covering all of its property and franchises. Directors of the company must be stockholders.

ROCKY RIVER POWER COMPANY

The Rocky River Power Company is incorporated to generate, transmit and sell electricity throughout Litchfield County, save in the towns of North Canaan, Salisbury, Sharon, Norfolk, Winchester and Torrington, and in Sherman, Danbury, Brookfield and Newton, in Fairfield county, for light, heat and power.

In the towns of Danbury, Bethel and New Milford the Rocky River Company can sell electric energy only after obtaining the consent of the electric companies now operating there. For these purposes the company may erect transmission lines along all streets of Litchfield County, save in the towns where it has no right to sell electric energy, and in the towns of Fairfield County above named. The company has power to purchase franchises. For the purpose of power development the company may erect dams at any points on the Rocky river, and may divert the water of that river into the Housatonic river at any point above the dam of the New Milford Electric Light Company. Lands necessary for dams, reservoirs, canals and other purposes connected with power development by the Rocky river may be taken by the company, and it may apply to the Superior Court and have the damages to the owners of the property determined. The location of any road or highway may be changed by the company. The act of incorporation states that no water of either of the rivers named may be diverted outside of Connecticut.

Capital stock of the company is fixed at a minimum of $50,000, and a maximum of $500,000, and bonds may be issued of a par value up to the full amount of the outstanding capital. These bonds are to be secured by a mortgage of the water power, plants and franchises which the company owns.

NORTHERN CONNECTICUT POWER COMPANY

The Northern Connecticut Power Company was incorporated to erect lines on all the streets of Hartford, Litchfield and Tolland counties, for the purpose of supplying electric energy. Water rights, lands, electric plants, and stocks and franchises of other companies engaged in similar business may be bought by the Connecticut Company. In the three counties named, the company may sell electric energy for any purpose, outside of the territory of any other electric company. To an electric railway the Connecticut Company may sell energy even in the territory of another electric supply company. Lines of the Connecticut Company may pass through the territory of any other electric supply company in order to enable the Connecticut Company to deliver energy in other places. The company is also authorized, so far as its charter can give such authority, to transmit energy from the three counties named into Massachusetts. In Hartford and towns contiguous thereto, in Winchester, Torrington, Bristol, Southington, Plainville, New Britain and Berlin, the Connecticut Company can neither sell nor transmit electrical energy without the written consent in each case of the company now engaged in electrical supply for each of these places. The Connecticut Company has no right to generate electric energy from water

powers on either the Farmington or Housatonic rivers in Connecticut. The plans of the company are understood to include the development of electric energy by water powers along that part of the Farmington river which is in Massachusetts. The Farmington River Water Power Company owns certain reservoirs in Otis, Massachusetts, and these reservoirs add to the value of water powers on this river in Connecticut. To protect these Connecticut water powers the charter of the company provides that none of the rights and franchises granted to the Connecticut Company shall be exercised, as to the transmission of energy generated in Massachusetts, until the Farmington Company, the Connecticut Company, and the persons or company developing electric energy with water power of the Farmington river, in Massachusetts, record a certain three-part agreement with the Secretary of State for Connecticut. Provision must be made in this agreement, satisfactory to the Farmington River Water Power Company, for the use of water from the Otis reservoirs in a way that will not injure the owners of water power on the Farmington river in Connecticut.

Capital stock of the Connecticut Company may be any sum of $100,000 to $200,000, and the bonds may be issued up to three-fourths of the capital. These bonds may be secured by a mortgage on the franchises and property of the company. Besides the stocks just named, the company may issue additional stocks or bonds to cover the purchase of the stock, bonds, property, or franchises of any other corporation in similar business, or to pay for the construction of its dams, power plants, and transmission lines.

North Haven Gas and Power Company

The North Haven Gas and Power Company is authorized to generate and distribute gas and electricity in the towns of Durham and North Haven, for light, heat and power, except that electricity may be supplied in only those parts of North Haven where no existing company is distributing it on July 1, 1906, and gas may be supplied in the same town only in case an existing company fails to lay gas pipes in certain streets before the same date. The North Haven Company may sell any of its own property, rights, and franchises, and may purchase the stocks, bonds, property, rights and franchises of any other gas, electric or power company. Capital stock of the company is fixed at a minimum of $50,000, and a maximum of $500,000. Bonds equal in par value to the stock paid in at any time may be issued, and these bonds may be secured by a mortgage of the property and franchises of the company. A consolidation may be effected between the North Haven Company and any other gas, electric light, or power corporation of the State.

Glastonbury Power Company

The Glastonbury Power Company is authorized to erect plants for the development of electric energy in the town of Glastonbury, and on the Scantic and Podunk rivers, in the towns of South Windsor and East Windsor.

For the purpose of developing the power of Roaring brooks in Glastonbury, the company may erect dams thereon, dig canals, and create reservoirs, and lands may be taken under the general laws for these purposes. Electrical energy may be transmitted by the company throughout the towns of South Windsor, Glastonbury, and Rocky Hill, and may be sold in the two latter towns for light, heat and power. The company may also deliver energy at the boundaries of these towns for the use of electric lighting and railway companies in other towns. Franchises may be bought and sold by the company, and it may construct an electric railway from the Connecticut river in South Glastonbury to the Manchester town line. Parts of this railway are to be located on the highway, and land for other parts may be taken by eminent domain. On this railway both passengers and freight may be transported, but the freight cars of steam railways cannot be hauled thereon.

Capital stock of this company is fixed at a minimum of $350,000 and a maximum of $800,000. The rights of the company as to bond issues are fixed by its earlier charter of which the act of the present year is an amendment.

Uncas Power Company

By the terms of its charter the Uncas Power Company may generate electric energy in any part of the county of New London, save in the territory of the New London Gas and Electric Company, in the town of East Lyme south of the tracks of the N. Y., N. H. & H. R.R., or in Lebanon, Franklin, and Bozrah. This energy may be transmitted anywhere in the county of New London, save in the territory of the New London Gas and Electric Company, and may be sold at any point in this county except in the territory of companies now authorized to distribute electricity. In Norwich and Jewett City, where there are municipal electric plants, the Uncas Company may sell and distribute electricity only under contracts with these municipal corporations. Energy may be delivered by the company to any street railway company. The Uncas Company may issue capital in any amount from $50,000 to $1,000,000, and may issue bonds to any amount not exceeding three-fourths of the full-paid outstanding capital stock at any time, and these bonds may be secured by a mortgage of its property and franchises. The company may sell its own franchises, and purchase the stocks and franchises of any other corporation in similar business. Payment for the property, stocks or franchises of any such other company, or for the construction of the power plants and transmission lines of the Uncas Company, may be made in bonds or full-paid stock of this latter company, and stock or bonds so paid may be additional to the amounts nominally authorized. The Uncas Company may also merge and consolidate with any street railway company.

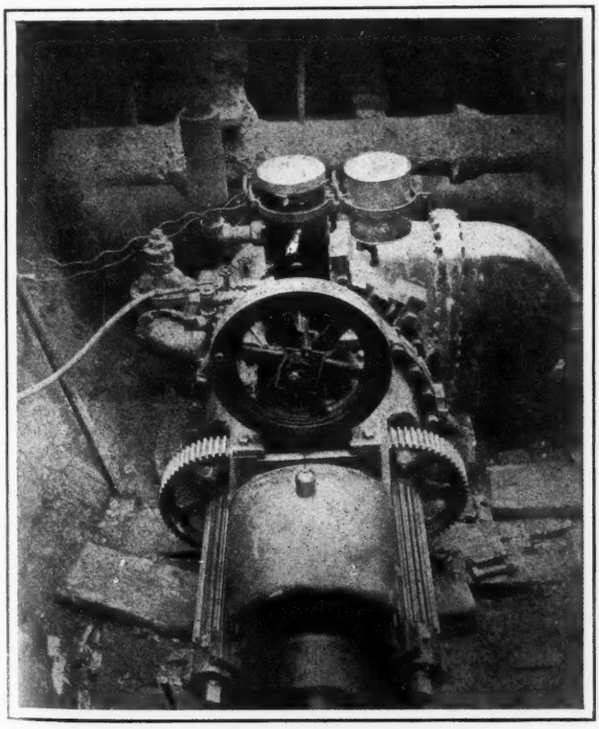
By an amendment to its charter, the Norwich Water Power Company is authorized to develop electric energy with its water power, and to sell this energy to the lessees of its water power, and to the city of Norwich. The company may also contract with the city of Norwich, which operates a municipal electric plant, for the right to dis-

tribute electric power there, and may lease the lines of the city, and erect such poles and wires as may be necessary to deliver electricity to the lines of the city or to the lessees of its water power.

The like of the first six charters named above cannot be found, perhaps, in the legislative records of any other State. One of these charters authorizes the combination of all the gas and electric supply companies in the State. Another grants power to bring every electric lighting and street railway system of the State into the hands of a single corporation, and either of two of the charters may be used to combine all of the electric supply systems, with a capitalization limited only by the prices in stocks and bonds that the present owners of these systems choose to put on their properties.

CONNECTING WATER PIPES

THERE is illustrated herewith the making of one of the largest connections of water pipes yet attempted, the pipe being under pressure. This was successfully performed in Trenton, N. J., at the corner of Pennington avenue and Willow street, a 30-inch connection being made to a 30-inch main. It will be seen that a gasoline engine was used for furnishing the power, the whole contrivance being economical of trench room. This method is becoming more and more common with larger sizes of pipe. Small cities which would not have many such connections to make generally hire the apparatus from the makers. At the present time there are not many contractors who perform this class of work, but as its success is being demonstrated, it is being taken up in all sections of the country.



SHOWING METHOD OF CONNECTING 30-INCH MAIN WITHOUT TURNING OFF WATER
(Pennington Avenue, Trenton, N. J.)

SYSTEM OF ROAD OILING

The Santa Monica Method of Using Asphaltic Oil—Material Thoroughly Mixed and Tamped—Extent of Applicability Limited

SANTA MONICA, California, has for about two years been experimenting with a new system of applying oil to streets and roads, and is now ready to recommend it to other municipalities where conditions are similar. It may be said to be a pavement construction, rather than a dust-laying process, and is described as follows by *Municipal Affairs,* of Los Angeles:

The street, which is a sandy loam, with some admixture of blue and red clay and slate and gravel, is graded and plowed six inches deep and pulverized with harrows. If it is very dry, a small amount of water is sprinkled on and mixed in so as to make it workable. Oil is then applied at the rate of one gallon to the square yard, and the cultivators mix it in to the depth of four inches. A second gallon of oil to the square yard is then applied and cultivated down to five inches. The oil is then turned under with a turning plow, four inches deep. Up to this point the process does not materially differ from that in general use where careful work is done in the mixing of oil with soil in the making of a road. But the next step is a radical departure, and marks the beginning, it is contended, of a new era in road making.

THOROUGH TAMPING ESSENTIAL

The process next succeeding this in the common forms of road oiling is the rolling of the road, which crushes down a thin scum on the surface that later scales off and leaves the road full of chuck holes. But with the new system the next process is one of tamping. A huge cylinder about eight feet long and five feet in diameter, weighing some 5,000 pounds, and furnished with rows of flat-headed teeth, is hauled back and forth over the street, slowly tamping the oiled earth up from the bottom to within two inches of the top. When the tamper first goes over the street it sinks the teeth, which are about six inches long, clear to the end in the soft, oily earth, but each time a new layer of solid asphalt is plastered on the bottom, and the cylinder rises a little out of the mass until, when the tamping is finally completed, the mixture is so solid that the teeth no longer sink in. There is a vast difference between merely crushing the surface of an oiled road with a roller and tamping five or six inches of oil and soil from the bottom up. That difference means years of wear.

At this stage of the proceedings the tamping is brought to within two inches of the top. The street is then regraded, and the two inches of loose soil are cultivated and given one gallon more of oil to the square yard. That is altogether three gallons to the square yard, all applied warm, so as to sprinkle freely. Again the cultivator, and then the tamper, this time worked until it reaches the surface. When the tamper is done, the surface is a little uneven from the marks of the teeth, and this is taken out

by a roller weighing two tons to 12 inches of tire. A more perfect surface can be obtained by a slight sprinkling of gravel before the roller comes on.

The cost of this work is about 16 cents a square yard, or $1 a running foot, to a 56-foot street (between curbs). The cost on the ordinary city street where no grading was needed would amount to from 30 to 40 cents a running foot of frontage. In other words, if done under the Vrooman Act, a street could be practically paved for about $15 or $20 to the lot—provided that curb, sidewalk and gutter were already in place.

The oil used is of 12.5 gravity, Baume, containing 69 per cent. of soft D grade asphaltum, free from sediment. The time required for the work is about twenty days to the mile.

One square yard of road, 6 inches deep, contains 4.5 cubic feet of material. Three gallons is equivalent to 0.4 cubic feet. If the oil is 69 per cent. asphaltum (the remainder being presumably volatile), there would be added to each 4.5 cubic feet of sandy loam about 0.28 cubic feet of asphaltum, or about 6.2 per cent. by volume, or about one-half as much as would be used in an equal bulk of asphalt paving. Taking into account the method of application, it seems probable that the top 3 inches contains two-thirds as much asphaltum as would such a pavement. The amount of asphaltum used is also seen to be as much as would be required in a regular 3-inch wearing coat of asphalt. It is therefore, in effect, an asphalt pavement without foundation, and with poorly selected materials, not thoroughly mixed. Since the expense of the foundation, of extracting the asphaltum from the oil and of transporting selected sand are avoided, the cost is of course less than of an asphalt pavement. The cost of mixing is probably greater than machine mixing of paving material, if done at all thoroughly. That such a process could safely or economically be used in all localities could not for an instant be claimed. For the natural soil must offer a good foundation, never water-soaked or other than firm and solid, and never heaved by frost. It must be largely sand or some other substance (if there is any) which would make a good wearing surface when cemented together by asphaltum. It must be located near wells yielding oils with an asphaltic base, to avoid the cost of handling and of freight on the useless volatile oils. In brief, it seems adapted only to a part of the Southwestern United States. Through other sections of this country and in Europe, however, tar is being used much as asphaltic oil is used in California.

CHAMBERSBURG, PA., WATER RATES

The water supply system of Chambersburg, Pa., was built in 1876, at a cost of $56,000, and now represents an expenditure of $146,000. The main features are one 2,000,000, and one 1,500,000-gallon reservoir; one 12 x 12 triple-expansion Stillwell and Bierce pump, capacity 2,000,000 gallons, and one 11 x 16 duplex pump, capacity 1,500,000 gallons. Water is taken from a creek near the city. Last year 510 tons of coal were used, costing $3.60 a ton. Other expenses totaled $10,033.03. Net profits, $5,669.64. The principal items of the water rates are as follows: Private stable (one stall and carriage), wash basin in chamber, urinal in private house, store, bank or office, and water closet in private house, $1 each. Bath tub in store, bank or office, urinal in saloon, wash pane (in connection with other openings), and water closet in store, bank or office, $2 each. Bakery, second-class barber shop, bath tub in private house, blacksmith shop (one fire), brewery (each 100 barrels), drug store (private attachment), steam engine (each horsepower), $3 each. Dwelling (yard hydrant and kitchen sink), wash pave (when no other opening), $4 each. Bath tub in saloon, church, drug store (public attachment), drug store fountain (1-16-inch jet), yard fountain, 1-8-inch jet (10 hours' service), urinal or water closet in hotel or boarding house, and water closet in saloon, $5 each. Bath tub in hotel and slaughter house, $6 each. Hotel bar, second-class livery stable, printing office, photographer, $10 each. Yard fountain, 1-4-inch jet (10 hours' service), first-class livery stable, public watering trough, $15 each

LOOSENING PAVING BLOCKS

Steam an Important Factor in Novel Method of Street Work—Softening Cement Joints—Experiments at Worcester, Mass.

A novel method of loosening granite paving blocks by the use of steam has been employed by the Water Department of Worcester, Mass. The blocks are laid on a Portland cement concrete foundation and grouted with cement. Like most public work in Worcester, this paving seems to have been well and substantially constructed. Steam has frequently been used for removing frost in various cities in and out of New England, but this is the first instance of which we have heard of its use for softening cement joints. The process is described to us by the City Engineer, Mr. Frederick A. McClure, as follows:

"The process consists of laying a steaming box over the line of the trench in lengths of fifteen feet, the sections having a width of thirty inches, and a depth of fifteen inches. The joints were covered with burlap, partly filled with sand, and the edges next the pavement buried in a few inches of the same material. Steam was supplied from a small portable boiler, carrying a pressure of about 80 pounds, and connected by a steam hose to a perforated pipe extending the entire length of the box described. The pipe had a diameter of 1¼ inches, with perforations 3-16 inches in diameter, spaced 8 inches on centers, the steam being controlled by an ordinary valve, opened, perhaps, one and one-half turns. For convenience of operation sixty feet of pavement was steamed at one time, and required about one-half ton of coal in twenty-four hours. This was sufficient for two shifts, or a steaming and resetting of boxes every twelve hours. After treatment, the blocks would readily separate with wedge and maul, with about 75 per cent. of the blocks suitable to relay. The concrete foundation was disintegrated, and a pick could readily be driven through it. The success of the operation appeared to depend upon the length of time steam was applied, satisfactory results not being obtained in this case with less than ten hours' steaming."

With coal at $4.00 a ton on the street and boiler attendant at $2 a day, this would give a cost of 5 cents a running foot of trench, not including allowance for cost and depreciation of the plant, which would probably approximate 1.5 or 2 cents a foot. The question arises whether the disintegration of joints and foundation might not extend into and under parts of the pavement not taken up and reconstructed, which would be a serious objection to this process.

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NEW YORK, OCTOBER 3, 1906.

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Municipal Ownership and Municipal Salaries

A REPORT recently made upon a gas plant in a Southern city points out emphatically certain evils which experience has shown need to be specially guarded against in municipally managed enterprises. This report, by a special committee of the City Council, assisted by a well-known expert, alleged that the city's bookkeeping is so careless as to render impossible any accurate determinations of cost, profit, etc.; excessive cost of labor; obsolete plant; failure to obtain proper returns from by-products; absolute disregard of the wishes or needs of consumers, mains and services being repaired only where absolutely necessary, and meters never being overhauled until they ceased to register; also the absence of any comprehensive system of making repairs or keeping meter accounts. The remedy for all of this, the committee believes, may be the employment of a competent gas engineer, at adequate salary, to be given complete control of the gas works, including the right to employ and discharge all labor connected therewith.

There is probably no one subject connected with municipal government upon which the public generally needs so much enlightenment as that of salaries; or, at least, in connection with which there is so much need of a change in practice. The day laborer for the city receives, as a general thing, better wages than he could obtain elsewhere. But the officials who are the responsible heads of the cities' departments are generally either less efficient than such positions demand, or could obtain higher salaries elsewhere.

When most city positions were elective the honor of receiving them was the chief reward, and the matter of salaries was not an urgent one. But there is no particular honor attached to the position of Superintendent of Lighting, or even City Engineer, and the salaries must offer sufficient attraction in themselves to obtain the desired ability. Moreover, the ability, or lack of it, in a City Engineer has been difficult to prove so far as it was expressed in economy of expenditure; and hence the low salaries commonly paid such officials. But a lighting superintendent is inevitably compared as to results with the head of a rival plant in the same city, or a similar plant in a neighboring city, and his efficiency is computable. If he is a valuable man, private plants stand ready to pay him his worth, and to retain him the city must pay the same. One of the probable values of a uniform system of municipal statistics would be the ability to compare the work of various City Engineers, Street Superintendents and the like; to the weeding out of the incompetent and a rattling among the dry bones in some departments, let us hope. In fact, if every department of a city service could in some way be put in competition with private enterprise, there would be many surprises; as often at the excellence of the city work as the reverse. And there would also be a raising of salaries in many departments, necessary for obtaining a better man, or for keeping one whose value was just discovered by some private corporation as well as by the city.

In adopting municipal ownership of public utilities, cities should understand that those which do not become monopolies will have to meet competition, and to do so successfully must be managed by competent men at adequate salaries. Great corporations know, and the cities must learn if they are going into business, that the difference between success and failure often lies in the man at the head, and the right man earns and will obtain a high salary.

DESTROYING ALGAE

Method of Treatment with Sulphate of Copper Employed at Winston, N. C.—Effect on Filters—The Water Improved

By ROBERT B. HENRY,
City Engineer and Superintendent of Waterworks, Winston, N. C

The reservoir, the treatment of which is about to be described, is from 3 to 17 feet deep and has a capacity of about 100,000,000 gallons. It was formed three years ago by flooding a piece of cultivated land fringed with woods in a few places of small area. Water is conveyed from this in underground cast-iron pipes to filters of the Warren type.

About the 10th of May last, we first noticed an accumulation of algæ on the filter sand, and in four days it had reduced the capacity by three-fourths, despite the fact that the rakes were kept in continuous slow motion and the filter washed out every three hours. We then attached a trace chain to the back of the rakes, which caused the formation of a film on the surface of the sand and gave us about three-fifths the capacity of the filter. Soon after this we obtained a quantity of sulphate of copper and proceeded to apply it to the reservoir. As we had no boat or oars, we made a rough batteau of inch boards, 16 feet long by 3 feet beam, which was propelled by paddles. Two sacks which had been used for shipping filter sand were used, in each of which we placed 40 pounds of sulphate. These were suspended, one on each side of the batteau, one 3 and one 7 feet below the surface. These were dragged across the direction of the current in courses about 20 feet apart, more sulphate being added at the end of each course. We used 685 pounds in this manner in two days.

At the same time we began to treat the feeder of the pond as follows: Five pounds of sulphate were dissolved in two gallons of water in stone jugs. A 46-gallon whiskey barrel was placed 8 feet above the water at the mouth of the brook. A lead pipe led from the barrel, provided with a cock set to discharge the contents in 12 hours. This pipe crossed the stream, and contained five 1-16-inch holes on the down-stream side. Two and a half pounds of dissolved sulphate were used each 12 hours. The inflow at this point is about 1,500,000 gallons per 24 hours. The effect was noticeable in 36 hours after installation, and the algæ almost wholly disappeared in a week; although a month later a little was apparent at times. Consumers did not detect the presence of the sulphate. A "trace" was detected by the State Chemist, who was not informed of our procedure.

OZONE FOR WATER PURIFICATION

In a recent report of Dr. Miquel, Chief of the Micrographic Service of the Mt. Louis Observatory, to the sixth commission of the Paris Municipal Council, experiments on de Frise's system of sterilizing water by means of ozone are described, as follows:

"Experiments were undertaken with water filtered through sand at various speeds, in order to test the extent to which the bacteria present were destroyed by exposure to air containing very slight admixtures of ozone. From 50 up to 100 cubic meters of filtered water were dealt with per hour, and each set of tests lasted for five hours. The filtered water in very many cases contained germs of the bacillus coli, but after the water had been subjected to the de Frise process these bacteria were invariably destroyed. These experiments confirm the results obtained in a previous set of trials carried on during the first three months of 1905. Dr. Miquel reports that the process has been found capable of eliminating a large proportion of the bacteria present in water of various descriptions and of permanently destroying with certainty the germs of bacillus coli, which possess greater resisting power than the Eberth bacillus and the cholera spirillum. The cost of this treatment is stated, in dealing with large volumes, to be about 1½ centimes per cubic meter, say 1½ cents per 1,000 gallons."

NEW ENGLAND STREET SPRINKLING

Committee of Portland, Me., Reports on Methods Employed at Lynn, Worcester and Springfield, Mass.—Hartford in Line

A committee appointed by the City Council of Portland, Me., to investigate street sprinkling methods recommends that this be done by the city (either directly or by contract) and the expense assessed against the abutting property. The committee's report is in part as follows:

"The three Massachusetts cities visited—Lynn. Worcester and Springfield—sprinkle their streets in whole or in part at the expense of the abutters. In Lynn and Worcester the abutters on each side of the street pay one-half of the expense, while in Springfield the abutters on each side pay one-third of the expense each, while the remaining cost is paid out of the general tax fund. The Hartford system is like that of Lynn and Worcester in this respect.

"All the cities mentioned have their streets, which are partially occupied by street railways, sprinkled by means of street car sprinklers, and all have the car sprinkling done under contract, either directly with the American Car Sprinkling Company or with parties who have obtained their cars from this company.

"In Lynn and Hartford all the sprinkling, including the car sprinkling, is done by contract and the entire equipment is owned by the contractor. In Worcester the cart sprinkling is done by the city, while in Springfield the city owns the carts, but contracts for men and teams to run them. In all contracts the city is a party, and the street sprinkling assessments are collected by the city as other taxes are collected, the assessment being a lien upon the land by statute. In Springfield, where the most desirable results seem to be obtained, one man is employed to give his whole attention to looking after the street sprinkling to see that it is done satisfactorily. The contractor at Hartford has an automatic sprinkler which works well and is said to give good results. All the cities visited own their water supply plants.

"So far as the committee were able to learn, the system of sprinkling the streets at the expense of the abutters, wholly or partially, is satisfactory both to the city and the citizens, and the method of using car sprinklers having once been in use is indispensable, doing the work much more quickly and at a greatly less proportionate expense. The principal streets can thus be sprinkled eight or ten times a day when necessary. The cars have on each side double swinging arms, which enable the use of three quantities of sprays and may be adjusted to any width of street up to fifty feet wide with a single track, or seventy feet wide with a double track. These arms easily swing around any object on the street without coming in contact with it. A car will ordinarily sprinkle three-quarters of a mile of street without being refilled.

"The system in vogue in these four cities is unquestionably far preferable to the private contract system now in use in Portland. Your committee are therefore unanimous in recommending that a general law be passed in our next Legislature which will enable the cities of Maine to tax abutters for street sprinkling."

Since the report was submitted the matter has been taken up by officials in other cities in the State, and a determined effort will be made to secure action at the coming session of the Legislature. In any event there is no doubt that Portland is in a way to better conditions, if indeed she does not succeed in giving her citizens the best which is now offered in the line of street sprinkling.

PROBLEM OF WASTE DISPOSAL

An Important Municipal Function, Requiring Constant Supervision—Annual Expenditures of Cities—Necessity for Sanitation—Methods in Vogue

PROBABLY the most troublesome and difficult of the sanitary duties of a city are the collection and disposal of the various classes of waste, other than sewage. Various methods are in force in different cities, and in many cases one municipality has experimented in many directions in efforts to handle the problem in a manner satisfactory to the greatest number of citizens. The first table, presented below, gives a summary of certain of the statistics collected by the Census Bureau relative to these various services in the cities of the United States.

A more or less approximate gauge of the public realization of the importance of sanitation may be obtained from the expenditures to this end made by the municipalities of the country. The annual per capita expenditures by all cities having a population of more than twenty-five thousand and the total amount spent for each of the various services in all of them have been obtained. These data are presented in the second table below, and include expenditures for Health Department, quarantine and pest houses, hospitals, street cleaning, refuse disposal, etc. The private expenditures for these purposes, however, are not taken into consideration.

Methods of Disposal of Ashes and Other Refuse, and of Cleaning Streets

Cities Having Populations of	Number of Cities Disposing of: Ashes: By Householders	Ashes: Directly	Ashes: Through Contractor	Garbage: By Burning: By Sale	Garbage: By Burning: By City	Garbage: By Burning: By Contractor	Garbage: Otherwise: Directly	Garbage: Otherwise: Through Contractor	Dead Animals and Other Refuse: By Burning: By Sale	Dead Animals and Other Refuse: By Burning: By City	Dead Animals and Other Refuse: By Burning: By Contractor	Dead Animals and Other Refuse: Otherwise: Directly	Dead Animals and Other Refuse: Otherwise: Through Contractor	Dead Animals and Other Refuse: Otherwise: By Householders	No. of Cities Cleaning Sts. by Sweeping by: Hand	Machine	Both
More than 1,000,000	....	1	1	....	1	1	2	....	....	1	1	1	1	....	....	....	3
From 500,000 to 1,000,000	1	1	2	1	....	....	1	2	....	....	....	1	2	....	....	....	3
From 300,000 to 500,000	3	3	1	1	1	....	2	5	3	....	....	3	1	1	1	....	7
From 100,000 to 300,000	13	6	4	5	4	5	2	6	8	3	1	4	7	4	3	....	22
From 50,000 to 100,000	16	12	3	4	11	2	13	9	12	5	1	9	7	7	5	2	36
From 25,000 to 50,000	47	22	4	3	12	....	12	18	32	7	1	15	9	33	35	8	47

Municipal Expenditures for Sanitation

Cities Having Populations of	Municipal Expenditures Per Capita For: Health Department	Quarantine and Pesthouses	Hospitals	Street Sprinkling	Street Cleaning (excluding snow)	Refuse Disposal	Total
More than 1,000,000	$0.180	$0.070	$0.208	$0.009	$0.930	$0.183	$1.580
From 500,000 to 1,000,000	.200	.052	.480	.210	.715	.613	2.270
From 300,000 to 500,000	.138	.140	.150	.021	.490	.358	1.297
From 100,000 to 300,000	.122	.092	.266	.138	.372	.214	1.204
From 50,000 to 100,000	.117	.063	.098	.099	.343	.254	.974
From 25,000 to 50,000	.098	.064	.090	.076	.202	.135	.665
All cities	.144	.080	.199	.072	.563	.243	1.311
Total amount spent in all cities.	3,118,332	1,719,102	4,290,576	1,565,235	12,167,772	5,260,340	28,121,357

NEW YORK STREET PEDDLERS

Nearly 5,000 in the City—Push-Cart Commission's Report on Regulating Traffic—Licenses and How Granted

About a year ago Mayor McClellan, of New York City, appointed a commission to consider the great and growing evils connected with the push-cart traffic in the city. This commission, composed of seven private citizens and the Commissioners of Health and Street Cleaning, has reported its findings and recommendations, which are briefly summarized below. The Commissioners found between 4,000 and 5,000 push-cart peddlers, mostly crowded into limited areas, which crowding added to fire danger by hindering the engines and other apparatus. The intensity of crowding bears no relation to the needs of the crowded sections; in fact, probably all such peddlers could be abolished without any loss, except to themselves. Many peddlers' licenses are granted to rich padrones, each of whom employs numbers of poor men as peddlers. They consider that basket-peddling is a nuisance and should be abolished, and that sidewalk stands should be regulated as well as push-carts. The problem is a traffic problem, and should be regulated by the Police Department, but at present the police levy petty blackmail on the peddlers. The Commission believes that conditions in New York are so diverse in various sections as to call for a discrimination in making regulations. They advise that the city be divided into two broad districts, to be known as "Restricted" and "Unrestricted." Also that two classes of licenses be issued, "Traveling" and "Stationary," the former to be good only in unrestricted districts, but permit selling anywhere therein; the latter to be good only in restricted districts, and each for one particular station only. There would be a station on each side of each street twenty-five feet back from each corner, and nowhere else. The stations would be auctioned off to the highest bidder once each year, the minimum fee acceptable being $10. While this plan would remove congestion, it would permit more peddlers than at present in the district south of Fourteenth street and east of Broadway. Not only peddlers with traveling licenses, but horse-and-wagon peddlers would be excluded from restricted districts.

The licenses would be personal ones, and would not be issued to a storekeeper, nor to any peddler who does not own his own push-cart, which must be at hand when the license is issued, the license and number being affixed to it by the authorities. Each applicant should give his name, address, etc., and the authorities would take his photograph, which, with his height, weight, sex, color of hair, etc., would be placed on file. The license sign would give the number of the cart, and stationary licenses the location assigned. The report is very comprehensive, and will make a book of about 100 pages, with numerous tables, maps, photographs and diagrams, and it is probable that other large cities and some small ones, which are laboring with the same problem, may find valuable suggestions therein.

VIEW OF ORCHARD STREET, NEW YORK CITY
(Showing Push-carts)

HAGERSTOWN'S FINANCES

And What the Maryland City Charges for Water—Compare Figures with Reports from Other Cities—Receipts and Expenditures

Here are the figures showing the financial condition of Hagerstown, one of Maryland's thriivng cities on the borderland of the South. For purposes of comparison with reports from other cities, these figures are especially interesting:

Assessed valuations, $7,298,830; tax rate, 76 cents; Bonded Indebtedness, $128,000 at 4 per cent. as follows: Light bonds, $58,000; Street Paving bonds, $13,500; Drainage bonds, $54,500; Special Improvement bonds, $2,000.

Receipts, exclusive of light		$80,239.00
Redemption of bonds and interest	$11,662	
Fire	6,001	
Salaries	3,968	
Water	2,395	
Commissions	2,610	
Library	1,000	
Street	22,265	
Police	3,528	
Court and Jail	1,365	
General	5,891	
Elections	675	
Hospital	250	
Total disbursements, exclusive of light		$61.610.00

FILTERING NEW YORK'S CROTON WATER

On the 28th of last March, Mr. I. M. de Varona, Chief Engineer of the Department of Water Supply, Gas and Electricity, New York City, reported to Commissioner William B. Ellison on the filtration of the Croton supply, making a tentative recommendation for the construction of a filter on the roof of the eastern division of the Jerome Park Reservoir. At a conference on September 14, between the two gentlemen above named, Mr. Rudolph Hering, the consulting engineer, and Mr. W. B. Fuller, the filtration expert of the department, it was decided to urge the administration to adopt this plan. Mr. de Varona believes that this construction would be at least $5,000,000 cheaper than that first proposed of placing the filters at Elmsford (between the present Croton shed and the Jerome Park Reservoir), besides making available the storage in the bottom 40 feet of the Croton reservoir, which otherwise could be used only by pumping.

BALTIMORE'S SEWERAGE SYSTEM

Approximately 700 Miles of Sewers Included in City's Plans —Bids Opened for Work Involving $150,000 Expenditure.

BIDS were opened a few days ago for constructing the first ten miles of Baltimore's proposed sewerage system, which will apparently cost $150,000. The complete system will require about 700 miles of sewers, so that this is but a small beginning of probably the largest sewerage proposition ever undertaken. In addition, the city must construct a sewerage pumping station, estimated at $600,000; an outfall main, to cost about $1,000,000, and a disposal plant will add about $2,000,000 to the expenditure.

While there are several interesting features connected with the planning and construction of the conduit systems (there are two entirely separate systems, for storm and house sewage respectively), the greatest interest attaches to the method of disposal. By an act of the Legislature, to protect the oyster industry of Chesapeake Bay, the city is prevented from discharging anything but highly purified sewage therein or in any of its tributaries. Purification is therefore required, and a tract of land on Bock river, about five miles away, has been selected for this purpose. At the pumping station there will be, to begin with, three 72,500,000-gallon plunger pumps to raise the sewage against a dynamic head of 72 feet. On leaving the force main and outfall sewer, the sewage will flow through septic tanks, which have a capacity of 25,000,000 gallons, the rate being such as to allow six to eight hours in the tanks. The effluent from these is to flow onto sprinkling filters, which will be about nine feet deep and cover about 30 acres. The method of discharge is that which gave the best results in the Columbus experiments, and nozzles for this purpose are to be spaced about 15 feet apart over the surface. From these the sewage enters settling basins having a combined capacity of 11,000,000 gallons, in which, during a flow of about three hours, it is expected to deposit the films of matter which detach themselves at intervals from the stones of the sprinkling filters. A removal of bacteria up to this point of 95 per cent. is hoped for. A final filtration by sand filters is provided for, but the commissioners hope to be able to persuade the Legislature to permit the omission of these as unnecessary, since, after purification, the effluent flows for 14 miles in a stream about half a mile wide before entering the bay. To assist in the persuasion, the city will establish a testing station in miniature of the complete disposal plant, to prove the efficiency of the first three processes. As the sand filters alone would cost about $1,000,000, the city is anxious to make this test plant a convincing argument.

For building these sanitary sewers, the city has made an appropriation of $10,000,000, and an additional expenditure will be made for constructing storm water sewers. Calvin W. Hendrick is Chief Engineer of the Sewerage Commission which has charge of installing this mammoth, up-to-date system.

PUBLIC WORKS CONVENTION.

Interesting Papers Read Before Atlanta Meeting of the American Association—Surety Bonds and Awarding of Contracts.

AT the Atlanta, Ga., convention of the American Public Works Association, held September 14-15, last, several papers of such general interest were read that synopses of their contents are given as follows:

SURETY BONDS IN CONTRACTING

Mr. Fair Dodd, General Agent of the Ætna Indemnity Company, classified these as bid or proposed bonds, contract bonds and maintenance bonds; the first to guarantee that the principal will sign the contract if awarded the work, the second that he will faithfully perform the work according to the plans and specifications, and the third to guarantee the durability of the materials and quality of workmanship. The first, Mr. Dodd holds, should be received in place of certified checks, as better evidence of the responsibility of the bidder. A letter from a surety company, stating that it stands ready to execute a contract bond, should not be accepted. Before executing a contract bond the company must believe the contractor is getting a fair price and that the contract does not grossly favor the owner. The engineer should decide disputes, but his decision should be appealable to a board of arbitration. The contractor should be required to invest enough cash in each contract to guarantee good faith, and hence more than 10 per cent. should be retained from monthly payments. Maintenance bonds are looked on with disfavor by the companies because often claims are due to the results of causes over which the contractor has no control. Three years should be the time limit.

LETTING CONTRACTS AS A WHOLE

Mr. Richard C. Huston, City Engineer of Hattiesburg, Miss., stated that of all the contractors and engineers whom he has consulted, 85 per cent. preferred contracts let as a whole, because a better class of bidders responded, the entire responsibility was confined to one party, the work is more likely to be completed promptly, the engineer is saved much work otherwise necessary, friction between the various contractors is avoided, manufacturers do not become sub-contractors (this, it seems to us, is just the reverse of true); the cost is reduced, extras are reduced to a minimum, there is a uniform scale of wages on the entire contract, disputes as to exact limitations of each contract are avoided, and there is a definite payday. Some of the arguments in opposition were that by buying machinery and material directly from the manufacturer, better prices could be obtained. Changes in the order could be made more easily and the best rather than the cheapest material could be obtained. The manufacturers especially favor direct bidding, because the acceptance of their material depends on the general contractor's price, and only partially on their own; because their payment is uncertain, hence they must bid higher; and because the machinery may not be erected properly.

THE DISPOSAL OF MUNICIPAL WASTE

Systems and Methods, with Special Reference to American Conditions—The First Carbage Crematories —Official Reports and Criticisms

By W. F. MORSE, Sanitary Engineer

This Series of articles begun in the February number, will be continued until completed and will be illustrated by original drawings, cuts, diagrams and pictures, and contain many tables valuable for reference.

The Subjects Already Treated by the Author Are:—

1. The Waste Collection Service in American Towns; Methods and Results.
2. Definition of Terms; Quantities; Proportions; Character of Waste in General.
3. Garbage; Analysis; Proportions; Values.
4. Dry Refuse and Rubbish; Quantities and Treatment.
5. Classification:—Commercial Values after Recovery.
6. The Refuse Utilization Stations in New York, Boston, Buffalo, and Brooklyn (illustrated).
7. Municipal Ashes; Analysis; Proportions; Values when Separated.
8. Ashes from Cremation of Garbage; Analysis and Values; Comparative Table.
9. Comparison of Ashes from English and American Cities; Cremation Means.
10. The Utilization of Municipal Waste in General; English and American Methods.
11. Commercial Values of Refuse and Ashes when Marketed and Manufactured.
12. The Analysis of Garbage; Tankage, Its Value (Special Tables).
13. The Garbage Disposal Plant, Cleveland, Ohio.
14. Street Sweepings; Fertilizing Value and Treatment.
15. Comparative Commercial Values of Waste.
16. Foreign Destructors; Special Chapter by an Eminent Authority.

The Following Are to Appear:—

17. The First Garbage Cremators.
18. Official Reports on Cremators.
19. Apparatus and Furnaces; Record of Work (illustrated).
20. Types of Furnaces; Their Employment; Municipal, Institutional, Industrial, Medical, Laboratory (fully illustrated).
21. Calorific Value of Waste as Fuel (comparative table).
22. Reduction and Extraction Process Described and Illustrated; the Earlier and Later Methods.
23. American Methods; Col. Waring and His Successors.
24. Present Situation in This Country; Résumé.
25. Means for Improvement as Suggested by Several Investigators.
26. What May Be Expected of the Future.

Special Article—*Concluded.*

By W. FRANCIS GOODRICH, A.I.Mech E., F.I.S.E.

WHAT has been accomplished in Great Britain has not been without its effect upon municipal engineers in Continental Europe; there are abundant signs on every hand that when the present unsatisfactory methods of refuse disposal no longer satisfy, British destructors will be favored as offering a definite solution of what must everywhere become a serious problem.

PROGRESS IN THE EAST

In Cairo a 4-cell Horsfall destructor was erected about two years ago. Alexandria, the Egyptian city of scarcely less importance, has recently decided to adopt a British destructor.

Further east, in India, but little progress can be reported. A Baker destructor has been erected in Calcutta, which plant deals with about 130 tons daily. At Karachi, in the Punjab, are two Warner destructors, erected some few years ago.

At Singapore (Straits Settlements) a 4-cell Horsfall destructor will be erected during the present year.

Nothing has yet been done in Japan, but coincidently with the advance of Western civilization there will surely be a decided demand for sanitary improvement. In China, notoriously dirty, no progress can be recorded; even in the important cities of Hong Kong and Shanghai disposal by fire has yet to be adopted. It is, however, but fair to add that the garbage of the latter city is in constant demand for manurial purposes.

Kipling has said that "East is East and West is West, and never the twain shall meet." In final and sanitary refuse disposal they certainly will meet; with advancing civilization and a growing demand for sanitary reform there is not the slightest doubt that the time is coming when the ideal of the West will be the ideal of the East.

PROGRESS IN AUSTRALASIA

In Australasia progress is somewhat slow, but interesting developments may be looked for during the next few years. The important municipalities of Australia have moved very cautiously, notwithstanding the constant trouble arising from the tipping of refuse. In Sydney is a 6-cell Warner destructor erected four years ago; a new plant of greater capacity was projected two years since, but tenders have not yet been accepted. A Manlove destructor was erected in Melbourne (South) several years ago, and the authorities of this important Victorian city are likely to erect a modern plant in the near future. The municipality of Perth have recently decided to erect a Horsfall destructor; other cities such as Adelaide, Brisbane and Newcastle continue to contemplate cremation as the only way out of an ever-increasing difficulty.

At Toowoomba, near Brisbane, a Meldrum destructor of the Beaman & Deas type was erected about three years ago, specially arranged for the cremation of refuse and excreta. Annandale and Leichardt, two small townships on the outskirts of Sydney, have a Meldrum regenerative front-fed destructor, which deals with the refuse of both towns, some 25 tons daily.

New Zealand has, perhaps, a better record than Australia, viewed from the standpoint of modern British practice. At Christchurch a Meldrum Beaman & Deas destructor was erected about four years ago in combination with the municipal electricity works. The city of Auckland also has erected a 3-grate Meldrum regenerative top-fed destructor in conjunction with the electricity works. This plant has been in operation for some few months past and, like the Christchurch plant, with very satisfactory results.

Wellington has a destructor of the Fryer type, erected several years ago; a modern destructor of British make has recently been decided upon and will be erected in the near future.

South Africa

At East London and Durban (Natal) destructors of the Warner "Perfectus" type were erected some years ago, and these, the first destructors in South Africa, required the use of coal as a supplementary fuel. Within the past two years a Horsfall 3-cell destructor has been erected in Durban, a plant of the same type and size at Bloemfontein, and a 2-cell Horsfall destructor at Lorenzo Marques.

At Kalk Bay (Muizenberg), "the Brighton of Cape Colony," is a Meldrum 2-grate plant which is operated in combination with a large generating and main drainage works. Johannesburg has three 4-grate Meldrum patent regenerative top-fed destructors, which deal with nearly 200 tons of refuse daily; here, as at Kalk Bay, the power is fully utilized. It is worthy of note that the clinker at Johannesburg is a source of revenue, large quantities having been sent even as far as Bloemfontein sewage works for the bacteria beds there. The municipality of Pretoria has recently desided to install a Meldrum regenerative top-fed destructor to dispose of some 40 tons of refuse daily. The plant will have a capacity of 60 tons daily.

The General Distribution of Destructors

It will now be clear that the British refuse destructor is an established success in many countries. (The many foreign and colonial installations are shown in the following Table No. XXX) and it must be obvious that the experience gained in the treatment of a great variety of waste in a number of countries has placed the leading makers of destructors in England in a very strong position.

It is but fair to argue that those destructors which are successfully dealing with a variety of waste in tropical and other countries could be readily adapted to the requirements of American municipalities, and in the treatment of the waste of such municipalities a useful experience would be brought to bear upon the problem.

There are obvious difficulties to be faced in connection with the choice of the site; there ever will be; ignorance has always to be combated, but those who have the interests of the ratepayers at heart must be prepared for opposition. With well over 100 destructors in operation on central sites in the United Kingdom, very few complaints have been made.

Needless to add to insure such a result the destructor must be well designed, contained within suitable buildings, efficiently operated and carefully supervised. Under favorable conditions it should then be, if not actually self-supporting, at any rate such a small charge upon the rates as would pass unnoticed by the intelligent citizen who realizes to the full the great sanitary gain.

TABLE NO. XXX

British Refuse Destructors Throughout the World

	1	2	3	4	5	6	7	8	9	
Maker	Great Britain and Ireland	Continental Countries	Australasia	South Africa	Canada	South America	Far East	Egypt.	Miscellaneous	Total
Meldrum Bros., Ltd.	72	Paris. St. Etienne.	Christchurch. Auckland, N. Z. Annandale. Toowoomba	Kalk Bay. Johannesburg. Pretoria.	Westmount (Montreal).	.....	.....	.....	.....	82
The Horsfall Destructor Co., Ltd.	53	Brussels. Zurich. Hamburg. Monaco Czarskoe Selo. St. Petersburg.	Perth.	Durban Bloemfontein. Lorenzo Marques.	.....	Para. Pernambuco.	Singapore	Cairo.	.....	67
Manlove, Alliott & Co., Ltd.	61	Gibraltar.	S. Melbourne. Wellington, N. Z.	.....	.....	Para. Pernambuco.	.....	.....	Georgetown (Demerara).	67
Goddard, Massey & Warner, Ltd.	28	.....	Sydney.	E. London Durban.	.....	.....	Karachi.	.....	.....	32
Heenan & Froude, Ltd.	21	Ixelles.	.....	.....	.....	.....	.....	.....	.....	22
Hughes & Stirling.	7	Fredericksburg.	.....	.....	.....	.....	.....	.....	.....	8
Joseph Baker & Sons.	1	.....	.....	.....	.....	Buenos Ayres. Manaos.	Calcutta.	.....	.....	4
Totals...	243	11	8	8	1	6	3	1	1	282

Destructor Work of the World

In the foregoing papers, Mr. Goodrich has summarized the work done in the past twenty-five years in Great Britain and other countries by the several forms of destructors devised and built by English makers for the disposal of towns' refuse. It is a record of results, not of appliances or processes. It deals with the subject as a whole and is not concerned with the successive experiments and steps by which the desired end is reached. A standard is created by which we may in this country measure our own progress and note by comparison the position occupied in this same class of work. Many valuable suggestions are also given of which we might take advantage.

Absence of Reliable Data

In attempting to collect and reduce to an intelligent form the scattered and meagre data existing on the subject of municipal waste disposal, the writer is confronted with the fact that there are but few reliable reports upon this work from authorities that are competent and unbiased. There are many accounts of the operation of crematories, written mostly by those directly interested on behalf of the builders or the town authorities. Probably the largest number of these were drawn up by newspaper writers, who designed to give a record of the current news items for home consumption, but were often inaccurate and not always true. In the absence of correct returns these items are put forth as authoritative accounts of the work and are used as an indorsement of the particular furnace elsewhere, and, being accepted without investigation, perpetuate and multiply the errors. While in many cases these accounts must be taken as the only existing record, they must be accepted with the utmost caution until verified by other and more independent observers.

In this connection the great engineering journals have exercised a wise discretion and admitted to their columns the detailed description and illustrations of plants installed, accepting no responsibility for their operation and refraining from comment upon the claims made for successful design or performance of any particular plant. This has compelled more accurate and better accounts, and it is to the columns of these journals that we must look for reliable details of construction and operation.

First Garbage Crematories—Official Reports and Criticisms

Up to 1884 there was little or nothing known in this country of the process of destroying offensive waste by fire. In England, a Fryer furnace had been built at Manchester in 1876, and this destructor, with some changes and modern attachments, is now operating. This furnace was followed by the "Beehive" and several others. The *Sanitary Engineer and Weekly Journal* (now the *Engineering Record*), of New York, gave a brief account of these, with such illustrations as were available, but little interest was shown in the matter, and no similar furnaces were built here until 1886.

First U. S. Government Garbage Furnace

In December, 1884, Lieut. H. J. Reilly, U. S. A., at that time Post Quartermaster at Governor's Island, New York Harbor, addressed the Editor of the *Sanitary Engineer*, saying that he had a daily average of five cubic feet of garbage which he wished to cremate, and asked where he could find information as to the proper construction and size of a furnace for the purpose. In reply, the Editor referred to the previous issues of the *Sanitary Engineer* describing the "Fryer" destructor, the "carbonizer" at St. Pancras, London, the Leeds destructor, and the "Beehive" destructor at Burnley, England.

In the August 13, 1885, issue of the *Sanitary Engineer* appeared the letter of Lieutenant Reilly reporting the construction of a garbage furnace at Governor's Island, New York Harbor, as follows:

Office Post Quartermaster, Governor's Island, N. Y.

July 29, 1885.

Sir:—I enclose herewith a sketch to scale of the garbage furnace which is in use here, as it may interest your readers.

The garbage, varying in daily quantity from ten to thirty cubic feet, used to be buried, but the small extent of good ground available for the purpose became so saturated that in the summer time especially the odor was distinctly perceptible, and not agreeable. For this reason it was finally decided to burn the garbage, and I made many unsuccessful attempts to get some information as to the proper construction of a furnace for the purpose.

I finally appealed to you, and it was on information derived entirely from your valuable paper that the furnace now in successful operation was built. An experimental one, which gave excellent results, was first tried by obtaining an old brick oven so as to get something similar to "Fryer's Destructor" which was described in your paper.

The one now in use consists essentially of a chamber 4 x 5 x 3 feet lined with fire brick and divided into three spaces by two gratings, composed of ¾-inch round iron bars, with inch openings between them, and the necessary doors, grate bars (surface six square feet), and ashpit. The gratings are for the purpose of supporting the garbage, so the heat can get through and dry it and to prevent it from stopping the draft or putting out the fire.

The operation was commenced by making a coal fire and putting the garbage on the right side to dry; the next day's garbage was put in on the left side and the dry garbage was raked over the fire. By putting garbage in on the left and right sides alternately dry garbage is supplied and the fire kept constantly burning.

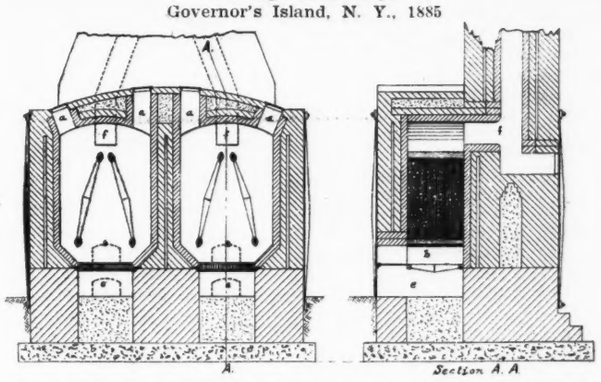
The chimney, owing to its location, had to be built fifty feet high, although it was intended originally to have it only thirty, which would have given ample draft. The total cost was about $350. There was a slight inoffensive odor from the chimney which is perceptible in certain conditions of the atmosphere; it is very similar to that given off by burning letter paper. No fuel of any kind other than the garbage is used or needed, unless the fire is allowed to burn out, when, of course, some fuel is necessary to start the new fire. One man has charge, and after putting in the day's garbage generally limits his attention to raking the dry garbage over the fire at noon and again at sunset.

Very respectfully,

H. J. Reilly.

This form of furnace was afterwards built by the U. S. Government at many of the Army posts and depots, and continued in use up to 1894, when the last example was

Garbage Crematory,
Governor's Island, N. Y., 1885



CROSS-SECTION, SHOWING GRATES AND FIRE BOXES

SIDE VIEW, SHOWING GRATES AND FLUES

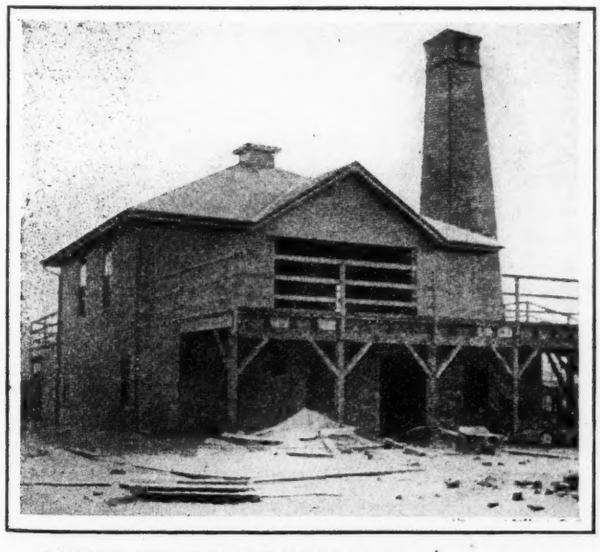
built by the writer at Fort Totten, Willets Point, New York Harbor. The capacity of all is very small, rarely exceeding one ton daily.

The same construction as that described by Lieutenant Reilly was followed at Fort Totten, except that the grates for sustaining the garbage were made of steel railroad bars set in heavy castiron headers at the top and bottom. But the weakness of this form of grate bars exposed to the direct action of the fire made constant repairs necessary, and the absence of any device for consuming the gases that passed direct to the chimney was a fatal defect.

As the first example of the "garbage cremator" in this country it did the duty for which it was required quite as successfully as some of its later, more complicated successors. This furnace at Governor's Island was removed in 1904, after nineteen years of continuous service, and replaced by a furnace built by the Municipal Engineering Co., of New York.

First Municipal Garbage Furnace

In September, 1885, Dr. Baird, Health Officer of Wheeling, W. Va., appealed to the *Sanitary Engineer* for information on garbage furnace, and was responded to by a reference to the destructors used abroad and to the Government cremator at Governor's Island. None of these suited the case, and the town authorities began a series of experiments in destroying night-soil by fire. At first the waste was mixed with coal slack and burned in gas retorts, which was too expensive; later an old steel-heating furnace was used with better success. Finally the city, in 1886, contracted with Mr. M. V. Smith, of Pittsburgh, to build a furnace of the Siemans regenerative plan, employed by obtaining high temperature in iron and steel mills. The capacity was to be sixty tons daily of garbage, night soil and dead animals. The location was on a top of a hill, chosen probably for fear of offensive fumes. The furnace—afterwards known as the Smith-Siemans Crematory—has been continuously in use for upwards of twenty years. Many repairs have been made, but the original design has been substantially followed. At this time the city is rebuilding the plant, with the intention of continuing the disposal of garbage and night soil, and no other waste is received. Natural gas is the fuel. No available reports of costs of construction, repairs or operation can be had, and so far as known there are no pictures or cuts of the plant in existence.



EXTERIOR, THE ENGLE CREMATORS AT WORLD'S COLUMBIAN EXPOSITION, CHICAGO, 1893

Reports upon Early Crematories

The earliest furnace that came into general use was the Engle cremator, the first example being in Des Moines, Iowa, in 1887. During the following years up to 1893 there were twenty-five Engle cremators designed and built for destroying garbage and night soil, using various fuels. These furnaces were described and approximate reports of operation were given by many local authorities, but no official report was had until William S. MacHarg, civil engineer, in charge of water and sewage disposal of the World's Columbian Exposition, Chicago, 1893, made a test of the two Engle cremators designed and built by the writer there in use, and submitted the result to D. H. Burnham, Director of Works. From this report the following is condensed:

The Engle Cremators at World's Columbian Exposition, Chicago, 1893

Number of Cremators, two, capacity each	50 tons
Fuel, Crude Petroleum, fed by Air Compressor.	
Tons of garbage destroyed	5,009 "
Tons of Sewage Sludge destroyed, 1854, equivalent to tons of garbage destroyed	4,000 "
Total destroyed during six months	9,009 "
Gallons of Oil Consumed	169,839 gals.
Labor, 3 shifts of 5 men and Engineer eight hours each.	
Cost of disposal of garbage	$.67½
Cost of disposal of sewage sludge	$.75½

The operation of the Cremators was exceedingly satisfactory. All the material was thoroughly burned without producing fumes with odor. The carcasses of many animals were also destroyed.

These cremators were removed from the grounds at the close of the Exposition. The Engle Company was awarded the grand prize for its work in connection with this exhibit, and another prize for the *Engle Fire Closet*, for the destruction of night-soil, also employed in exposition work.

MONTCLAIR, N. J., AND ITS WORK

Interesting Data Concerning Operations of Various Departments—Success with Tarred Telford Pavement—Sewerage Water and Lighting—Finances

The town of Montclair, N. J., was organized under the Town Law, in 1894, with a population of about 11,000. The population of the town as appears by the State census of 1905, is 16,370. The bonded indebtedness on January 1, 1906, amounted to $484,500, showing a charge of $29.60 per capita. Owing to a change in 1905 which established the beginning of the fiscal year on January 1 instead of May 1, the figures given here cover a period of but eight months, from May 1 to December 31, 1905. The total of receipts during this period is given in the Treasurer's report at $515,055; disbursements, amounting to $435,917.

RECEIPTS

May 1, 1905. To Balance		$4,519 82
To Temporary loans	$152,000 00	
Taxes	310,008 07	
Railroad Taxes	484 18	
Interest on taxes and assets	5,632 07	
Interest on main sewer assessments	1,330 47	
Assessments—		
Sidewalks and street improvements	$3,173 41	
Sewers	30,456 98	
Removing snow	185 40	
Recording and canceling and costs	511 32	
Searches	102 00	
Tax searches	103 74	
Tax sales	158 33	
Sewer maintenance	1,118 06	
Road repairs	162 51	
Dog registration	887 25	
Licenses, General	951 00	
Licenses, Excise	4,400 00	
Fines and penalties	540 25	
Board of Health	614 05	
Incidentals	38 10	
Deposits for sewer connections	20 00	
Deposits for street improvements	350 00	
Deposits for lateral sewer	450 00	
Unappropriated and unexpended balances	1,277 39	
Fire Department	51 00	
Board of Chosen Freeholders. Return of Deposit	50 00	
		515,055 58
		$519,575 40

PARK STREET, MONTCLAIR, N. J.

DISBURSEMENTS

1905.		
Temporary loans	$116,000 00	
Interest on above	2,180 43	
State and County taxes	73,422 09	
The Commissioner of the Sinking Fund—		
Appropriation of the Sinking Fund	$15,000 00	
Collection from main sewer assessments	13,744 29	
Collection from main sewer interest	1,099 11	
	29,843 40	
Board of Education	68,308 00	
Board of Health	3,878 60	
Free Public Library	4,853 27	
Public Parks	3,000 00	
Lateral sewer construction	8,573 24	
Working streets	5,541 80	
Incidentals	15,561 54	
Street Lighting	11,628 45	
Police Department	14,412 83	
Fire Department	13,636 74	
Road repairs	27,359 52	
Poor	3,629 38	
Water	7,277 22	
Interest on bonds	20,102 50	
Sewer maintenance	3,750 59	
Miscellaneous	2,867 79	
		435,917 39
Dec. 31. Balance in Treasury		83,658 01
		$519,575 40

Montclair has at this time an assessed valuation of about $12,100,000, taxed at the rate of $2.92 per hundred. The corporate business of the community is entrusted to a Town Council, consisting of a Mayor and two Councilmen from each of the four Wards. Each member of the Council receives $150 per year. Meetings are held twice a month, usually upon the second and fourth Mondays. The principal salaries paid are: Treasurer, Collector, and Town Clerk, each $2,000 a year; Superintendent of Roads and Sewers, $1,800, and Town Attorney, $1,500.

The town bounds enclose an irregular parallelogram lying along the foot and upon the slope of a hill of considerable altitude, which ranges through the entire length of the town for about four miles north and south; the east and west dimension being about two miles in length. This hill, locally known as "The Mountain," has a very decided bearing upon the cost of street maintenance, as most of the east-west streets have heavy grades which subject them to severe washing and necessitate ample, well-built gutters.

Department of Roads and Sewers

Montclair can boast of its streets as surpassed by few, if any, municipality of its class. There is a total of sixty miles of them, a large proportion of which are paved with Telford their full width, while others, where travel is lighter, have only a strip of Telford sixteen feet wide in the center. Paving blocks are used only on that part of the streets used by the street railway.

Montclair has set the pace in this country in the use of Tarred Telford pavement. In some instances the tar was used as a binder in laying new pavement, and in others it was used in the top dressing with stone dust over surfaces which were yet in good condition. The result has been highly satisfactory, in that these streets have thus far stood the test of heavy traffic without sign of wear or disintegration, and the dust

nuisance is largely abated. This allows a saving in cost of sprinkling. "Tarvia," a coal-tar composition made by The Barrett Manufacturing Company, was used on this work.

To keep the surface of these macadam streets in good condition, continued top dressing is necessary on the grades, and this year about nine-and-a-half miles were regularly top-dressed and repaired where necessary. This work required 6,000 square yards of broken stone and involved an expenditure of $13,000; an average cost of about twenty-seven cents per lineal foot. The town owns a 10-ton Buffalo Pitts roller and two horse-rollers, and an average of 15 men are employed in this Department throughout the year.

Street sprinkling for the period cost nearly $3,000, and was performed on 142 days. This is done largely to preserve the Telford, as well as lay the dust, and for this work the Department operates three Studebaker sprinklers.

A daily collection of garbage and ashes is now being made by the town, free of charge to householders. This contract was let recently at $10,000 for one year. The wagons are owned by the town. Garbage is buried in trenches on vacant land rented by the town for this purpose, and ashes are disposed of by the contractor on dumps or for filling, while the waste paper and rubbish is burned, or sold if of sufficient value to pay for sorting.

The total expenditure in the Street Department was $27,359. For sewer maintenance the town paid $3,750. This Department is responsible for over 50 miles of sewers, 23 miles of which have been laid since 1900. The sewage is emptied into the Passaic River at Belleville, N. J., through a brick joint-outlet sewer which also serves Bloomfield, Glen Ridge, and Orange. The maximum and minimum dimensions of sewer-pipe in use are 24 inches and 8 inches, respectively.

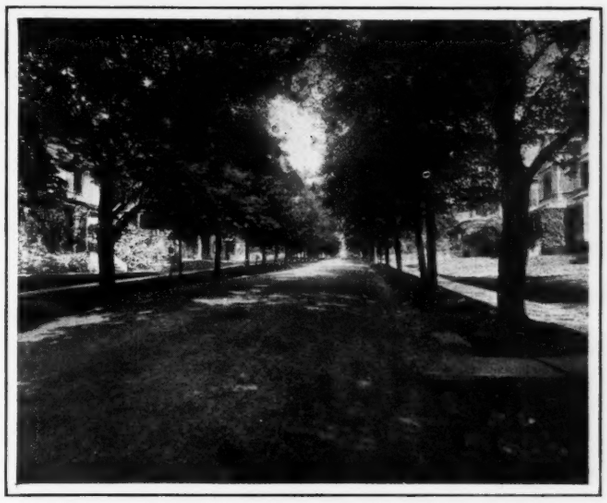
Water Supply

Montclair is served with water by The Montclair Water Company, a private corporation, which draws its supply from the Passaic River at Little Falls, N. J. Here the water company has a very complete and effective filtration plant, from which the water is pumped to a reservoir on "The Mountain" above the town. The quality of the water is excellent, without color or sediment, and may be used unfiltered from the tap for table purposes. Every house is supplied with a "Trident" water meter, and a minimum rate of $10 a year, with a charge of $2.25 per thousand cubic feet, is paid by the average householder.

For fire hydrant service the town paid last year $5,662. There are 457 of these in use. The charge is $26 per year each. "Mathews" and "Corey" hydrants are both used.

Fire Department

The apparatus used in the Fire Department consists of one chemical and combination wagon, one second-class city truck (both of American La France Engineering Company make), one third-class Seagrave truck, four hose wagons, and two supply wagons. As there is an average pressure of 120 pounds at the hydrants all over the town, the Department gets along very well without the aid of fire engines. The Gamewell signal system is used, and the Department owns 7,000 feet of 2 1-2-inch Eureka hose. There are 102 men on the roll of the Department, but only 11 under pay, at a salary of $900 a year each.



WALNUT STREET, MONTCLAIR, N. J.
(Showing pavement partly rolled)

The expenses of the department for the eight months amount to $13,636. In this time there were 38 alarms; the estimated loss about $4,500.

Street Lighting

The Public Service Corporation and the United Electric Company of New Jersey supply Montclair with gas and electricity. Their bills for the eight months were: Gas, $7,429; electricity, $4,199.

There are at present 578 ordinary (open flame) gas lamps in service, with 55 Welsbach lamps. The charge for the open flame lamp is $17.50 per year each, or $1.41 per month, while the Welsbachs cost $28.50 each per year, or $2.45 per month. The town pays $16 per year per lamp for the use of 262 32-c.p. incandescent electric lamps, and 24 arc lamps cost $90 each per year. All these lights are burned every night until daylight.

As Montclair is almost entirely a residential town, with a very small factory or laboring class population, the duties of the Poor and Police Departments are not heavy. The Poor Department costs the town $3,629. Four men and three women are now town charges, while five Montclair children are in charge of the State Board of Children's Guardians. The Police Department numbers a Chief, three Sergeants, two Roundsmen, 15 patrolmen and five chancemen. The Chief's salary is $1,500 a year; the others range from $700 to $900. The Department reports 268 arrests for the past eight months. The expenditures for this period were $14,412; fines collected, $408. A police patrol telephone system was installed last year.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Buildings, Bridges and Street Railways—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Street Improvements				
Indiana	Rockville	October 4	Constructing two gravel roads	Henry Grube, County Auditor.
Ohio	Bucyrus	October 4	Paving Lucas Street	F. E. Donnenworth, Bd. Publ. Serv.
Ohio	Toledo	October 4	Paving Lawrence Avenue	Reynold Voit, Sec'y Bd. Pub. Serv.
Indiana	Connersville	October 4, 7:30 P.M.	Grade and pave Western Avenue with brick	Jacob S. Clouds, City Clerk.
Ohio	Martins Ferry	October 4	16,283 yds. brick or block, 5 streets	E. D. Lash, City Clerk.
Indiana	Decatur	October 5 10 A.M.	Constructing two macadamized roads	Adams County Commissioners.
Ohio	Canton	October 5	8,300 yds. brick paving, 3,000 ft. curb	B. F. Faust, Clk. Bd. Pub. Service.
Indiana	Indianapolis	October 5	Ten contracts for grading, paving, etc	Board Public Works.
Indiana	Decatur	October 5	Macadam roads in Washington and Preble	C. D. Lewton, County Auditor.
Ohio	Akron	October 5	Paving Adams and Long Streets, brick	C. H. Watters, Sec'y Bd. Pub. Serv.
Ohio	Cincinnati	October 5, noon	50,000 yds. crushed stone on streets	M. J. Keefe, Clk. Bd. Pub. Service.
Ohio	Cleveland	October 6, 11 A.M.	Completing Schaaf road improvement	Julius C. Dorn, Clerk County Com'rs.
New Jersey	Cape May	October 6, noon	Grading 7½ miles streets	Edmund K. Brown, Engineer.
Ohio	Rudolph	October 6	Construction of one-mile stone road	J. C. Friend, Village Clerk.
Indiana	Spencer	October 6	One mile gravel road	G. O. Mitten, County Auditor.
New Jersey	Hohokus	October 6	Constructing stone road	R. Wanmaker, Mahwah, Engineer
New Hampshire	Concord	October 8	Grading and graveling road, Hampton Falls	A. W. Dean, State Engineer.
Ohio	Cincinnati	October 8, noon	Werk-rd., grade, curb, macadamize, etc	M. J. Keefe, Clk. Bd. Pub. Service.
New York	New York	October 8, 3 P.M.	Regulate, grade, curb, flag eight streets	John F. Ahern, Borough President.
Illinois	Chicago	October 8, 3 P.M.	Changes in driveway at Post Office	J. K. Taylor, Washington, D. C.
Louisiana	New Orleans	October 8, 1 P.M.	Asphalt paving, curbs, gutter, walks, etc	Chas. R. Kennedy, City Comptroler.
Virginia	Manassas	October 10	Macadamizing	O. E. Newman, Chairman.
Nebraska	Omaha	October 10, noon	Grading 19,000 yds. Calhoun road	D. M. Haverly, Co. Clerk.
New Jersey	Camden	October 10	Macadamizing 3½ miles of road	J. J. Albertsen, County Engineer.
Ohio	Toledo	October 10	Paving streets with brick or other material	Reynold B. Voit, Secretary.
Missouri	Kansas City	October 10, 11 A.M.	Regrading and macadamizing two roads	J. L. Phelps, County Clerk.
Ohio	Steubenville	October 12	Paving Washington Street with brick	T. W. Vance, City Clerk.
Ohio	Cincinnati	October 12, noon	Gravel and crushed stone on roads	Fred Dreihs, Clerk County Com'rs.
Iowa	Des Moines	October 12, 11 A.M.	Macadamizing 5,567 sq. yds	Board Public Works.
Indiana	Terre Haute	October 13, 11 A.M.	Grading and graveling four roads	Jerome W. Denehie, County Auditor.
Ohio	Cleveland Heights	October 13	Constructing sidewalks	W. J. Phare, Village Clerk
New Jersey	Fort Mott	October 15, 11 A.M.	Grading roads, 28,500 bushels oyster shells	Quartermaster.
Ohio	Euclid	October 15	Constructing sidewalks	Evers Eng. Co., Cleveland.
New York	Brooklyn	October 17, 11 A.M.	Asphalt and cement paving, curbing, etc	Bird S. Coler, President.
Indiana	Greencastle	October 20, 11 A.M.	7,688.5 ft. macadamized road in Mill Creek	C. C. Hurst, County Auditor.
Florida	Fort Barrancas	October 22, 11 A.M.	Constructing concrete walk	Lt. L. S. Chappelear, Quartermaster.
Michigan	Byron	October 31	Constructing one-mile roadway	M. J. O'Meara, Town Clerk.
Water Supply				
Virginia	Norfolk	October 4, 4:30 P.M.	Constructing reinforced concrete reservoir	Jamestown Exposition Company.
Kentucky	Henderson	October 4	4,000,000 gal. high-duty pumping engine and a 150-h.p. boiler	Wm. Sieber, Superintendent W.Wks.
Oklahoma	Frederick	October 4	Water system, incl 40-ft. well, power-house, 20 h.p. gasoline pump, mains, etc	John Carr, Pres. Water Board.
Florida	Jacksonville	October 4, 3 P.M.	Pumping engine, 8,000,000 gallons capacity; max. head, 270 feet	R. N. Ellis, Superintendent.
Louisiana	Crowley	October 5	Water works plant	George H. Horton, City Clerk.
New York	Ward's Island	October 5, 2 P.M.	Constructing 12-in. water line	Purchasing Steward, Hospital.
Indian Territory	Atoka	October 8	Waterworks system	W. Bassett, Mayor.
New York	Lockport	October 8, 8 P.M.	Complete water works system	E. S. Bennett, City Clerk.
Indian Territory	Ada	October 9	Waterworks system	J. P. Wood, Mayor.
New York	New York	October 10, 2 P.M.	Laying 12 and 24-inch water main	Wm. B. Ellison, Commissioner.
New York	New York	October 10, 2 P.M.	704,000 lbs. castings, condensers, hydrants	Wm. B. Ellison, Commissioner.
Virginia	Charlottesville	October 10, noon	Concrete dam 400 ft. long, 67 ft. high	Channing M. Bolton, Engineer.
Virginia	Manassas	October 10	Water works plant	O. E. Newman, Chairman.
Illinois	Chicago	October 10, 11 A.M.	350 ft. water pipe tunnel under Chicago River	Wm. L. O'Connell, Com'r Pub. Wks.
Nebraska	Ft. Snelling	October 10	Constructing addition to pump house and furnishing boiler and feed-water heater	Capt. Wm. D. Davis, Q. M.
Ohio	Lima	October 10	Pumps, 6,000,000 gal., max. 70 lbs	L. L. Crumerine, Sec. Bd. Pub. Serv.
Idaho	Caldwell	October 13, 6 P.M.	Extension to water system	R. S. Madden, Mayor.
Virginia	Fort Monroe	October 15, noon	Constructing 50,000,000-gal. steel water tank	Capt. R. H. C. Kelton, Quartermast'r.
Texas	Ft. Bliss	October 15, noon	Sinking 12-in. tubular deep well, installing pump and constructing shelter and trestle 150,000 gal. steel tank on 70-ft. trestle	Lt. C. Schudt, Quartermaster.
Indian Territory	South McAlester	November 1	Extending mains	Geo. Wilcox, City Engineer.
Sewerage				
Missouri	Kansas City	October 4, 11 A.M.	District sewers in five districts	E. A. Harper, City Engineer.
Ohio	Cleveland	October 4	Constructing sewers	W. J. Springborn, Pres. Bd. Pub. Ser.
Missouri	St. Charles	October 4, 7 P.M.	Emergency pumping plants	Burns&McDonnell, Kansas City, Eng.
New York	Buffalo	October 4, 11 A.M.	Three sewers, 12 and 10-in. tile	F. G. Ward, Com'r Pub. Wks.
Ohio	Middletown	October 4, noon	Two sewers, 2,380 ft., 12 to 20-in. pipe, etc	N. G. Oglesby, Clk. Bd. Pub. Serv.
New York	Buffalo	October 4, 11 A.M.	Constructing 12 and 10-inch tile sewer	F. G. Ward, Com'r Public Works.
Ohio	Canton	October 5	2,000 ft. storm and 3,600 ft. 8-in. sanitary sewers, 10 catch basins	B. F. Faust, Clerk Board Pub. Serv.
Louisiana	Crowley	October 5	Sewerage system	George H. Horton, City Clerk.
New York	Fort Ontario	October 6, 11 A.M.	Constructing storm-water drain	Lt. Henry H. Hall, Quartermaster.
Nebraska	McCook	October 8	2,600-ft. 8-in. sewer, etc., Dist. No. 1	W. A. Middleton, City Clerk.
New Jersey	Cape May	October 8, 8 P.M.	Constructing part sewer system	J. R. Brooks, Chm. Com. Sts.
Indiana	Brookville	October 8	Constructing public drain	Franklin County Commissioners.
Nebraska	Omaha	October 8	Brick or concrete sewer, 3,700 ft., 7½ ft. and 800 ft. 7 ft. in diameter	Dan B. Butler, City Clerk.
Ohio	Willoughby	October 8, noon	Main line and trunk sewer, mile long	C. C. Jenkins, Village Clerk.
Nebraska	Omaha	October 8	Relief main sewer, 4,500 ft. brick or concrete	Andrew Rosewater, City Engineer.
Indian Territory	Ada	October 9	Constructing sewer system	J. P. Wood, Mayor.

Sewerage—*Continued*

New Jersey	Rahway	October 9, 8:30 P.M.	966 ft. 12-in. pipe sewers	Franklin Marsh, City Engineer.
Pennsylvania	Emsworth	October 9, 4 P.M.	Main sewer and two outlets, 6,367 ft. brick and D. S. pipe sewer, 23 manholes, etc.	John McBride, 516 Fitzsimons Bld. Pittsburg, Borough Engineer.
North Carolina	Fayetteville	October 10, noon	Sewer system	W. N. Tillinghast, Clerk Public Works Commissioners.
Iowa	Des Moines	October 11, 11 A.M.	Constructing 34,000 ft. 8 to 30-in. sewer	W. W. Wise, Board Public Works.
Ohio	Toledo	October 11	Constructing sewers, No. 7,982	Reynold Voit, Secretary.
Ohio	Lancaster	October 12	Constructing sewers, District No. 1	George S. Cunningham, Clerk.
Iowa	Des Moines	October 12, 11 A.M.	3,309 ft. 12-in. vitrified clay pipe sewers	W.W. Wise, Board of Public Works.
Iowa	Fort Dodge	October 15, 5 P.M.	590 ft. 10-in. pipe sewer	L. Fessler, City Clerk.
South Dakota	Yankton	October 15, 8 P.M.	10,000 ft. pipe sewer, manholes, flush tanks.	W. L. Bruce, City Engineer.
South Carolina	Orangeburg	October 15	Sewer system, to cost $50,000	Edward Hawes, Jr., City Engineer
District of Columbia	Washington	October 18, noon	Constructing sewers	H. B. F. Macfarland, Com'r.
Illinois	Rock Island	October 31	Sewers and drains, District No. 2	Geo. W. McCaskrin, Pres. Bd.
New Jersey	Fort Lee	November 1	Sewer system, to cost $100,000	Dan'l W. McAvoy, Mayor.
Indian Territory	South McAlester	November 1	Sewer system, to cost $25,000	J. M. Gannaway, City Clerk
New York	Syracuse	January 2	Sewer system in Elmwood Dist., cost $50,000.	H. H. Brewster, Engineer.

Public Buildings

Ohio	Lakewood	October 5, noon	New school building	J. O. Gordon, Clerk Bd. of Education.
Arkansas	Thornton	October 6	Two-story brick school-house	G. I. Wise, Pres. Sch. Dist.
Louisiana	New Orleans	October 8	Erecting central library	F. White, City Comptroller.
New York	New York	October 8, 11 A.M.	Additions and alterations, etc, schools	C. B. J. Snyder, Supt. School Bldgs.
New York	Brooklyn	October 9, 10:30 A.M.	Two new engine houses	John H. O'Brien, Fire Commissioner.
Ohio	Oberlin	October 9	Four-story-fire-proof library for Oberlin College, cost, $125,000	Patton & Miller, Hartford Bldg., Chicago, Ill., Architects.
District of Columbia	Washington	October 11	Constructing and equipping Walter Reed Army General Hospital	Capt. A. W. Butt, Quartermaster.
Ohio	Athens	October 11, noon	Women's dormitory, Ohio University	L. M. Jewett, Secretary.
New York	New York	October 12, noon	Erect complete 8 ward bldgs., Sea View hospital, Castleton, Richmond Borough	Robt. W. Hebberd, Commissioner.
Ohio	Celina	October 12	Constructing high school building	W. W. Shock, Clk. Bd. Education.
Louisiana	Houma	October 15	Repairs to Court House	Goledano & Co., New Orleans, Arch.
Louisiana	Schriever	October 15	Repairs to Court House	Chas. V. Moore, Chairman Com.
Colorado	Grand Junction	October 16, 2 P.M.	Five brick buildings	Chas. E. Burton, Superintendent.
Ohio	Youngstown	October 19, 11 A.M.	Officers' quarters and barracks	Constructing Quartermaster.
New York	Ellis Island	October 20	Contagious disease hospital	J. K. Taylor, Washington, D. C.
Pennsylvania	Dravosburg	October 20	Three-story school, to cost $40,000	Charles E. Long, President.
District of Columbia	Washington	October 22, noon	Erecting guard house	Capt. J. S. Sewell, Soldiers' Home.
District of Columbia	Washington	October 23, 2 P.M.	Fire-proof, marble-faced mess hall and dormitory building	Capt. J. S. Sewell, Soldiers' Home
Kentucky	Louisville	November 4	One-story, $25,000 brick and stone library	R. M. Brown, Sec'y Libr. Trustees.
Louisiana	New Orleans	November 5, 1 P.M.	Central library building	F. White, City Comptroller.

Bridges

Illinois	Rock Island	October 4, 4 P.M.	Steel bridge, 100 feet long	County Clerk.
Indiana	Michigan City	October 4	Bascule bridge, Franklin street	H. M. Miles, City Engineer.
Ohio	Dayton	October 4, 11 A.M.	Erect two automatic swing bridges, and remove old bridge	T. J. Kaufman, County Auditor.
Ohio	Upper Sandusky	October 5, 1 P.M.	Superstructure three bridges: spans, 169; 73 and 153 feet; also repair abutments.	J. N. Traxler, County Auditor.
Ohio	Sandusky	October 5, 1 P.M.	Erecting three bridges	Auditor, Erie County.
Indiana	Indianapolis	October 6, 10 A.M.	Six bridges and two culverts	Cyrus J. Clark, County Auditor.
New Jersey	Camden	October 8, 11 A.M.	New bridge over Mt. Ephraim	J. J. Albertsen, County Engineer.
Indiana	South Bend	October 8, 11 A.M.	Three concrete and two steel beam bridges	John W. Harbou, County Auditor.
Indiana	Mount Vernon	October 8, 2 P.M.	Three steel bridges	Posey County Commissioners.
California	Daggett	October 8	253-ft. steel bridge	Board of Supervisors.
Virginia	Berryville	October 10	Steel or concrete bridge	P. McCormick, Secretary.
Ohio	Youngstown	October 10, noon	New floor, McGuffey Street, viaduct	George M. Montgomery, Co. Surv.
Indiana	Delphi	October 11, noon	Two bridges and three arch culverts	Fred H. Engle, Co. Auditor.
Massachusetts	Salem	October 15, 11 A.M.	Bridge, incl. 182 ft. revolving draw span, concrete pivot pier, pile bridge, 1,125 ft. long,	James P. Hale, Clk. Co. Com'rs.
New Brunswick	Hawkshaw	October 15	Construct sub-structure and approaches	C. H. La Billois, Dept. Public Works.
Manitoba	Winnipeg	October 16, 2:30 P.M.	Concrete bridge piers	H. N. Ruttan, City Engineer.
Georgia	Powers Ferry	November 8, 11 A.M.	Three-span bridge, 465 feet long	Clerk Road Commissioners, Atlanta.
Georgia	Johnsons Ferry	November 8, 2 P.M.	Three steel span bridge, 365 feet long	Clerk Road Com'rs, Atlanta.
Manitoba	Winnipeg	November 20, 2:30 P.M.	Superstructure steel highway bridge	H. N. Ruttan, City Engineer.

Miscellaneous

New York	New York	October 4, 11 A.M.	Hardware, paints, iron, etc	Francis J. Lantry, Com'r.
Tennessee	Memphis	October 4	5,000 ft. rubber cotton hose; 1,000 ft. double-ply hose, 2½ inches in diameter.	Board of Public Works.
Ohio	Cleveland	October 5, noon	5,000 ft. 2½-in. cotton rubber-lined hose	Wm. H. Ney, Sec'y Fire Dept.
Louisiana	Crowley	October 5	Electric light plant	George H. Horton, City Clerk.
Ohio	Oxford	October 5, noon	Two horizontal tubular steam boilers	S. H. Allen, Clerk, Bd. Pub. Affairs.
New York	Niagara Falls	October 6, noon	New station and reconstructing inclined railway, State Reservation	G. L. Heins, Albany, State Arch.
Pennsylvania	Middleport	October 6	Grading and constructing roadbed 8 miles electric railway; also another line	J. G. White & Co., Inc., Pottsville.
Rhode Island	Narragansett Pier	October 7, 7 P.M.	Lighting streets of village	James C. Davis, Town Clerk.
New York	New York	October 8, 2 P.M.	Furniture, gun racks, lockers, etc	George B. McClellan, Mayor.
Pennsylvania	Homestead	October 8	Combination hose and chemical wagon	Fire Chief.
District of Columbia	Washington	October 9, 10 A.M.	Machine tools, inc. crane, drills, lathes, etc.	H. T. B. Harris, P. M. G., U. S. N.
District of Columbia	Washington	October 9	Electrical supplies at navy yards	H. T. B. Harris, P. M. G., U. S. N.
Virginia	Norfolk	October 9, 10 A.M.	Machine tools at Navy Yard	Navy Pay Office.
New York	New York	October 9, noon	23,150 feet, board measure, yellow pine	J. McG. Woodbury, Commissioner.
New York	New York	October 9, noon	Removing snow and ice, winter 1906-7. Boroughs Manhattan, Brooklyn and Bronx	John McG. Woodbury, Commissioner.
New Jersey	Paulsboro	October 9, 7 P.M.	Erecting a gas plant	C. M. Gwilliam, Borough Clerk.
Georgia	Ft. McPherson	October 10, 10 A.M.	Installing 6 steam boilers and hot-water heating in twelve sets officers' quarters	Capt. B. B. Buck, Constr. Q. M.
Georgia	Dahlonega	October 10	500,000 brick N. Ga. Agr. College	Wm. J. Worley, Sec'y Bd. Trus.
Virginia	Manassas	October 10	Electric light plant	O. E. Newman, Chairman.
California	Fort Rosecrans	October 10, noon	Moving officers' quarters, replacing foundations, plumbing, wiring, water and sewer lines, etc.	Capt. C. D. V. Hunt, Quartermaster.
Missouri	St. Louis	October 12, noon	Four new drinking fountains	A. J. Reilly, Pres. Bd. Pub. Imprts.
District of Columbia	Washington	October 13, 2 P.M.	Granite for National Museum building	Bernard R. Green, Superintendent.
South Dakota	Fort Meade	October 13	Plumbing, heating, lighting for barracks	Major R. B. Turner, Quartermaster.
Iowa	Des Moines	October 15	Metal bookstacks for public library	Smith & Wetherell, Archs.
Ohio	Mansfield	October 18	Constructing 42 steel cells in reformatory	Fred S. Marquis, Secretary.
New Jersey	Fort Mott	October 20, 11 A.M.	Garbage crematory and building	Capt. Louis F. Garrard, Q.
California	Mare Island	October 30, 10 A.M.	Naval supplies, incl. electric crane	Navy Pay Office.

BIDS FOR STREET PAVING, HARRISBURG, PA.

When certain streets are ordered paved in the city of Harrisburg, Pa., bids for the work are received, several alternative kinds of paving being bid upon. If a majority of the abutting property owners on any street then express a preference for a given pavement on that street, the contract is awarded to the bidder so selected. In the absence of such a petition, Councils award the contract to the "lowest and best bidder." The following bids were received at Harrisburg in July and September of this year:

Paving—Prices bid, per square yard

Bidder	Lake Asphalt Sheet		Vitrified Block				Hassam
	Trinidad	Bermudez	Reese-Hammond	Montello	Mack Shale	Mack	
Bids of July, 1906. 24 Contracts							
A	$1.66 to $1.815						
B		$1.70					
C			$1.90	$1.80			
D				1.83	$1.79	$1.83 to $1.92	
Bids of September, 1906. 28 Contracts							
A	$1.63 to $1.67						
B		$1.69 to $1.85					
E							$1.55 to $1.60

Curbing—Prices bid, per lineal foot

	Granite	Granolithic	Steel-bound Granolithic	Berea Stone	Resetting Curb
Bids of July, 1906. 24 Contracts					
A	$0.99	$0.35	$0.50	.....	$0.20
B	0.87	0.47	0.57	$0.75	0.20
C	1.04	.....	0.80	.....	0.20
D	1.00	$0.45 to $0.50	$0.65 to 0.80	.....	0.20
Bids of September, 1906. 28 Contracts					
A	0.73	0.33	0.48	.....	0.20
B	$0.79 to 0.85	0.47	0.57	.....	0.20
E	0.90	0.55	0.70	.....	0.20

The Municipal Journal and Engineer wishes to obtain, at the earliest possible moment, advance and reliable information respecting all work projected. Any items sent us will be greatly appreciated. On request, copies containing such information will be mailed to you.

Address—

The Editor, Contract News Section,
The Municipal Journal and Engineer,
Flatiron Building, New York City

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All items arranged alphabetically by States.

STREET IMPROVEMENTS

Springfield, Ill.—An asphalt pavement, 30 feet in width, on a 6-inch concrete foundation, is to be laid in Clay street from Sixth to Eighth street.—H. H. Devereux, President, Board of Local Improvements.

Indianapolis, Ind.—Council has passed ordinances for paving a score of streets and alleys with brick, macadam, block, asphalt, or other material; the work will probably be done this fall.—E. H. Miller, City Engineer.

Burlington, Ia. — Council has decided to pave portions of Corso avenue.

Akron, O.—Engineer Payne is preparing plans and estimates for paving and macadamizing Cuyahoga street. — Nicholas Reid, Chairman Committee.

Akron, O.—Bids for paving Adams street have been rejected; E. McShaffrey & Sons were low bidders.

Barnesville, O. — Bids will be received, October 15, for bonds aggregating $2,991.45, for paving.—Address F. Waldo Hilles.

Cleveland, O.—Council has passed an ordinance to pave and curb several streets.—A. R. Callow, Secretary, Board of Public Service.

Columbus, O.—Nearly $1,000,000 will be expended this year for street improvements; a large amount of resurfacing will be done.

Greenville, O.—The paving of East Main street has been recommended.

Kenton, O.—Council desires bids for constructing 168 sidewalks, embracing nearly all the streets of the village; stone and cement and brick will be used.

Lorain, O.—Council is considering the paving of Eleventh and Thirteenth avenues.

Painesville, O.—Council is considering paving, curbing and laying sewer in St. Clair street, to cost $26,500, of which $17,000 shall be for paving and curbing; also laying storm sewer in Main street, to cost $1,500.—City Engineer Cummings.

Wooster, O.—Bonds, $1,800, will be issued for improving Cottage avenue.—J. B. Miner City Clerk.

Zanesville, O.—Bonds, $35,000, will be issued for sidewalk construction.—Neil Starkey, City Clerk.

Clarksville, Pa.—A special election will be held to pass on issue of $20,000 bonds for paving Depot street.

Erie, Pa.—Council has passed ordinances for paving West Twelfth street and East avenue and is considering grading, curbing and paving other thoroughfares.—M. Liebel, Jr., Mayor.

Dallas, Tex.—Council is considering issue of $600,000 bonds for street improvements.

Salem, W. Va.—Bonds have been voted for paving purposes.

Racine, Wis.—Council is considering ordinances for paving twenty-five streets or portions thereof, and for grading nineteen streets or portions of streets; estimated cost, $25,000.

CONTRACTS AWARDED

Columbus, Ga. — The Southern Bitulithic Company, Nashville, Tenn., has been awarded contract for 3,800 additional yards of paving.

Springfield, Ill.—John E. Bretz has been awarded contract for laying brick pavement in Edwards street, at $1.48 per square yard, and in Miller and Rutledge streets, at $1.66 per square yard for paving and 54 cents per lineal foot for curbing.—H. H. Devereux, President, Board of Local Improvements.

Chickasha, I. T.—The Cleveland Trinidad Paving Company, Cleveland, O., has been awarded contract for 16,000 square yards of paving, two-inch thickness of asphalt on a six-inch concrete foundation, at $2.15 per square yard; and 800 yards of dirt excavation, at 25 cents a yard; also 5,000 lineal feet of combined concrete curb and gutter, at 90 cents a foot; total, $49,000.—John H. Venable, Mayor.

Boston, Mass.—Warren Brothers Company has been awarded contract for 4,676 square yards of bitulithic.

Meridian, Miss.—The Columbus Concrete Company, of Columbus, has been awarded contract to lay concrete sidewalk in the business district, at $11,000.

New Brunswick, N. J.—The Standard Bitulithic Company, of New York City, has been awarded contract for 18,300 square yards of paving.

Columbus, O.—Paving contracts have been awarded as follows: A. G. Pugh, asphalt on Cherry street, $5,069, and Bolivar street, $15,000; Buckeye Engineering and Construction Company, Athens Block on Broad street, $11,345; W. H. Luchtenberg, alley, north of Buttles avenue, with Athens block, $6,900; W. E. Schwartz, Souder avenue, with Athens block, $5,600; Frank J. Fisher, Cleveland avenue, with block, $2,131; Barber Asphalt Company, Thirteenth avenue, $8,978; A. G. Pugh, Twelfth avenue, with asphalt, $17,581; D. E. Sullivan, Sixth street, with Nelsonville block, $4,925.

Lebanon, O. — Charles Stebbs has been awarded contract for constructing a number of new cement sidewalks, at 10¾ cents per square foot.

Painesville, O.—The Hanlon Construction Company, of Cleveland, will pave Mentor avenue.

Portsmouth, O.—Kelly Brothers will pave Market street with Portsmouth block, cement curb and gutter, for $6,500, and Fifth street with the same material, for $12,831;

Monroe & Son will pave Clay street with block on a gravel base, for $1,600, and Grand View avenue with block on a gravel base, for $10,569.

Erie, Pa.—Mayer Brothers have been awarded contract for paving the intersection of Second and Sassafras streets with asphalt, at $1.53 per square yard, $40 for catch basins and 45 cents per foot for curbing.

Hazleton, Pa.—The Standard Bitulithic Company, New York City, has been awarded additional contract for 540 square yards of paving.

Dallas, Tex.—The Texas Bitulithic Company has been awarded an additional contract for 2,575 square yards of paving.

SEWERAGE

Pine Bluff, Ark.—I. P. Shelby & Co. were low bidders for sewer construction, at $13,-149.90, their bid being as follows: 35 cents per foot for 8-inch pipe, 25 cents for 6-inch pipe, 3 cents for 8-inch cast-iron pipe, $32 for manholes under 12 feet, $58 for manholes over 12 feet in depth, $1.50 for drop connections to manholes, $48 for single flush tanks, $75 for double flush tanks, $6 per cubic yard for masonry, 15 cents per foot for trench 8 feet and under, 25 cents for trench 8 to 12 feet, 52 cents for trench 12 to 16 feet, 80 cents for trench 16 to 18 feet, 35 cents for embankment; material to be excavated, sand and clay, easy cutting, but probability of some quicksand; sheathing left in trenches 12½ per cent. per 1,000. Other bidders were Graham & O'Connell, Robinson Brothers, Nick Peau Construction Company.—W. J. Parkes, City Engineer.

Bainbridge Ga.—Bonds, $35,000, have been voted for sewerage purposes.

Argenta, Ill.—Council is considering the establishment of a $35,000 sewer system.

Chicago, Ill.—Bids will be received, October 3, for $50,000, 4 per cent. sanitary district bonds.—Robert R. McCormick, President of the Board.

Springfield, Ill.—Richard Egan has been awarded contracts for laying 18-inch pipe sewers in Williams and Mason streets, at 76 cents per lineal foot, 40 cents per lineal foot for inlet pipe and $23 each for manholes.—H. H. Devereux, President, Board of Local Improvements.

Akron, O.—Council has directed the construction of a main trunk sewer in and across High, Main, West and Exchange streets, Buchtel avenue, State and Center streets; sewers may also be built in Halsted street and Mayfield avenue.—Board of Public Service.

Athens, O.—Plans for extending the sewer outlet to a point below the waterworks pumping station have been presented to Council; the sewer is said to be a sanitary necessity; estimated cost, $6,000.—City Engineer Prouts.

Bucyrus, O.—Council has passed resolution to construct East Warren street sewer under suspension of the rules.

Cleveland, O.—Ordinances for constructing sewers in 30 different streets have passed Council and been approved by the Mayor; bids are invited.—A. R. Callow, Secretary, Board of Public Service.

Cuyahoga Falls, O.—Council has decided to issue $75,000 bonds to construct a sewer system.—C. B. Crumb, City Clerk.

Girard, O.—G. A. Gialdini & Co. were low bidders on work in Sewer District No. 1, their bid being as follows: 50 cents for excavating, 45 cents excavating H, $8 per 1,000 for brick, $6 per cubic yard for concrete, 4 cents per pound for iron, 32 cents per foot for 12-inch pipe, 17 cents for 8-inch pipe, 11 cents for 6-inch pipe, 9 cents for 5-inch pipe and 4 cents for 3-inch pipe; total, $8,901.50. Other bidders were: Armstrong, McGlachen & Dennis, Warren; S. H. De Groodt, Youngstown, and Moran & Davis. In District No. 2, S. H. De Groodt, Youngstown, was low bidder, as follows: 48 cents for excavating and excavating H, $9 per 1,000 for brick, $6 per cubic yard for concrete, 10 cents per pound for iron, 20 cents per foot for 10-inch pipe, 15 cents for 8-inch pipe, 10 cents for 6-inch pipe, 10 cents for 5-inch pipe, 3 cents for 3-inch pipe; total, $17,300.77. Other bidders were G. A. Gialdini & Co. and Moran & Davis, Girard & Armstrong, McGlaskin & Dennis, Warren.—Wm. Wilson, Youngstown, Engineer.

Girard, O.—Bonds, $30,000, will be issued for sewer purposes.—E. L. Hauser, Village Clerk.

Hamilton, O.—The City Engineer has been directed to prepare plans for sanitary sewers on five or six streets.

New Philadelphia, O.—The city is preparing to expend about $30,000 on a new sewer system for the west side.

Springfield, O.—Council has authorized the City Solicitor to prepare issue of $200,000 bonds for constructing high and low level and outfall sewers and disposal plant, recently designed by Snow & Barbour, Boston, Mass.

Toledo, O.—Council is considering the issue of bonds for constructing sewers.

Wellsville, O.—Council has asked for plans for a storm water sewer in Fifteenth street and one to drain Aten's run.

Shawnee, Okla.—A special election will be held to vote on issue of $150,000 bonds for establishing a sewer system; plans have been completed.

Erie, Pa.—Council has passed ordinances for constructing 12-inch sewers in Cascade and Fifth streets and is considering other sewer matters.—M. Liebel, Jr., Mayor.

Erie, Pa.—Council has passed order for $12,000 bonds for improving the sanitary condition of Mill Creek.—City Engineer Briggs.

Erie, Pa.—Patrick Doyle has been awarded contract for a large number of 15-inch and 9-inch sewers.

York, Pa.—Council has passed on first reading ordinance appropriating $550,000 for completing sewerage system and disposal plant and for paving streets.

Chase City, Va.—The city will shortly let a franchise for the construction of a sewerage and a water system, also for a gas plant.

WATER SUPPLY

Tuscaloosa, Ala.—The issue of $125,000 bonds for a water supply will be voted on at an election.—F. G. Blair, Mayor.

Vienna, Ga.—Bids will be received, November 1, for $20,000, 5 per cent. waterworks improvement bonds.—B. F. Forbes, Mayor.

Decatur, Ill.—Council has passed an ordinance authorizing issue of $125,000, 4 per cent. water bonds.

Grand Ridge, Ill.—Council is considering the issue of bonds for a water supply.

Ada, I. T.—An engineer will be selected, October 9, to have charge of the proposed water supply system, which is to cost $25,-000.—J. P. Wood, Mayor.

Lake Charles, La.—A pumping plant is to be established to water 5,000 acres of land.—Address W. L. Peters.

Chelsea, Mass.—The Board of Aldermen has appropriated $10,000 for the installation of meters.

Monroe, Mich.—Council has ordered issue of $85,000 bonds to purchase the plant of the Monroe Waterworks Company.

Elwood, Neb.—Bonds have been voted for constructing a water and light plant.

Kelliher, Minn.—The contract for laying 6-inch water mains in a 9-foot trench has been awarded to J. D. O'Connell at $1.50 a foot and 5 cents a pound for specials. A 40,-000-gallon standpipe 80 feet high is to be built by the Chicago Bridge and Iron Works for $2,900. The Eddy Valve Manufacturing Company was awarded the contract for 5-foot fire hydrants at $36 each, and for 6-inch gate valves. The Fairbanks-Morse Company is to furnish a 216,000-gallon duplex pump and a 50-horsepower tubular boiler.

Alliance, O.—Bids will be received, October 18, for $5,000, 4 per cent. 20 year waterworks bonds.—Charles O. Silver, City Auditor.

East Liverpool, O.—The citizens will vote on bond issue sufficient to improve the waterworks system.

Wellsville, O.—The Excavating and Construction Company of East Liverpool has been awarded contract for intake piping from the river to the pumping station, at $7,400.

Berwyn, Pa.—The water tower that supplied the citizens with water has been destroyed by fire; a new one will be built.

Memphis, Tenn.—An ordinance is before Council authorizing issue of $200,000 bonds for the water company.

Richmond, Va.—An appropriation of $163,-244.02 has been asked to increase the pumping capacity of the new pump house by 12,-000,000 gallons, the present capacity being insufficient.—Superintendent Rolling.

American Forks, Utah.—It is proposed to issue $20,000 in bonds for the improvement of the local water system.

Wise, W. Va.—Bonds, $30,000, have been voted for waterworks and an electric-light plant.

Randolph, Wis.—Langstadt & Meyer Construction and Supply Company, Appleton, has been awarded contract for constructing a water supply system.—J. O. Jones, Village Recorder.

Selkirk, Man., Can.—Bonds have been voted for the establishment of a water system.

LIGHTING AND ELECTRICITY

Oroville, Cal.—Plans for a light and water plant, prepared by J. L. Hehl, have been accepted.—Board of Trustees.

Washington, D. C.—Bids are invited for constructing the $1,300,000 power plant to be erected in Garfield Park to supply light, heat and power to all the Government buildings in the vicinity.—J. C. White & Co., Consulting Engineers.

Elgin, Ill.—The Aurora, Elgin & Chicago Railway proposes to expend $125,000 improving the local lighting system.

Richmond, Ill.—Bonds, $7,000, have been voted to construct a gas plant.

Washburn, Ill.—A franchise to establish an electric-light plant has been granted A. M. Searles.

Fort Dodge, Ia.—A dam yielding about 4,500 horsepower will be built in the Des Moines river by the Fort Dodge Light and Power Company.

Jonesville, La.—The city contemplates the erection of an electric-light plant.

Napoleonville, La.—Plans and specifications are to be prepared for an electric-light plant.—Address Town Council.

Elk Rapids, Mich.—A franchise to establish an electric-light plant has been granted William E. Donkey of Big Rapids.

Lake Placid, N. Y.—George A. Stevens will expend $200,000 enlarging the Stevens House, will enlarge the power plant and will construct an endless-cable railway between the hotel and boat landing; a new acetylene gas plant will be installed for lighting the Grand View Hotel, and an electric-light plant will be built for the Ruisseaumont Hotel.

Grand Forks, N. D.—The Grand Forks Gas and Electric Company has taken out a permit for a new power house; cost, $28,000.

Ashland, O.—A municipal light plant is to be established; the Rhinelander Power Company, which is developing a great water power on White river, has petitioned for a franchise to transmit electrical current into and throughout the city for power and lighting purposes, and agrees to supply the city with current to operate a municipal lighting plant.

Logan, O.—Plans have been prepared for a $16,000 municipal lighting plant.

Milford, O.—Plans have been prepared for a $20,000 power plant for the Little Miami Lighting and Power Company.—John W. Hill & Son, Cincinnati, Engineers.

Springfield, O.—Council has granted a franchise to the I. C. & E. Traction Company; a $50,000 power house will be built at once.

Terrell, Tex.—Plans and estimates for a $15,000 lighting plant have been prepared by Engineer J. D. Smith.

Salt Lake City, Utah.—A. M. Hill has petitioned for right to build a dam to develop water power to operate the machinery of the electric plant on Blacksmith's Fork.

Alexandria, Va.—The Alexandria Electric Light Company, which was recently awarded franchise to supply the city with electricity for light, has purchased property on South Union street and will erect a $75,000 plant.

Bristol, Va.—A committee has been appointed to investigate the cost of establishing a municipal lighting plant.

FOREMAN.—Large and well-known construction company has opening for man thirty to fifty years old who is aggressive, knows how to push work and can boss a gang of men. Must also have had practical experience in erecting heavy iron and steel railroad bridges. Can use three or four men with above qualifications in West Virginia, Pennsylvania, Ohio and Indiana. Salary, $1,920 to $2,100. Preference given to a man who has worked his way up from a position in the gang. Write us to-day. Hapgoods, 305 Broadway, New York.

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For Machines to Drill, Blast and Test Holes and Water Wells, write "LOOMIS CO., TIFFIN, O."

FIRE EQUIPMENT AND SUPPLIES

Pratt City, Ala.—A new fire company has been organized.—Fred Lewis, President.

Connersville, Ind.—The City Hall will be enlarged to make room for the Fire Department headquarters, and a new fire station will be built by day labor.—Jacob S. Clouds, City Clerk.

Warsaw, Ind.—Recommendation has been made that the fire system be improved.—Charles B. Moore, Fire Chief.

New Orleans, La.—Plans and specifications have been prepared for a two-story engine house for Chemical No. 13, to be located at Alix and Verret streets, Algiers.

Ann Arbor, Mich.—The city proposes to establish a fire station at West Main and Hill streets.

Lima, O.—Bonds, $40,000, will be issued for fire equipment.—Mr. Shanahan, Board of Public Safety.

Denison, Tex.—Council is considering the erection of an additional fire station.

Reardon, Wash.—A volunteer fire company has been organized.—Joseph Guth, Chief.

PUBLIC BUILDINGS

Los Angeles, Cal.—The citizens will vote in November on issue of $9,000 bonds for improvements in the County Building.

Vallejo, Cal.—The School Board proposes to issue bonds for the erection of a high school.

Indianapolis, Ind.—Plans have been selected for the proposed City Hall and Coliseum.—Rubush & Hunter, 22 Fitzgerald Building, Architects.

Madison, Ind.—Contractor Canfield will build the $200,000 Hospital for the Insane.

Seneca, Kan.—A new $10,000 county jail, having modern scientific, sanitary and ventilating features, is to be built.—Nemaha County Commissioners.

Port Huron, Mich.—A two-story school building, to cost $100,000, is to be erected; plans have been prepared.

Amory, Miss.—Bonds, $14,000, have been voted for school purposes.

Marshall, Mo.—The citizens will vote on issue of $50,000 bonds for erecting a high school.

Bellefontaine, O.—Bonds, $60,000, have been authorized for a new high school building.

Dennison, O.—The citizens will vote on issue of $70,000 bonds for school purposes.

Lorain, O.—The citizens will vote, October 8, on issue of $150,000 bonds for school purposes.—E. E. Hopkins, City Clerk.

Middletown, O.—Bonds, $15,000, have been voted for a high school building.

Nashville, Tenn.—Council is considering issue of $300,000 bonds for erecting a new high school.

Fort Worth, Tex.—The Polytechnic Heights School District has decided to issue $15,000 worth of bonds.

Quanah, Tex.—Bonds, $50,000, have been voted for a new Court House for Hardeman County.

Rogers, Tex.—An issue of $12,000, 5 per cent. 20-year school bonds has been approved by the Attorney General.

Claremont, Va.—An election will be held to vote on issue of $6,000 bonds for erecting a school house and $2,000 for sinking an artesian well.

BRIDGES

Bluffton, Ind.—The Wells County Commissioners have appropriated $15,000 for a bridge across the Wabash river at Main street; the City Council has made an appropriation for several smaller bridges.

Duluth, Minn.—A $12,000 bridge is to be constructed in Lincoln Park.—R. D. Rayer, Commissioner.

Elyria, O.—Bonds, $70,000, have been voted for bridges at Fourth street and East Broad street.

Chillicothe, O.—The Capitol Construction Company has been awarded contract for 66-foot span bridge over Little creek, at $848, and for two 100-foot span bridge over North Fork of Paint creek, at $4,000. Other bidders were Oregonia Bridge Company, Riverside Bridge Co... ny, Wyncoop & Gormerly, Central Concrete and Construction Company. Frank Hanawalt was awarded contract for substructure of Little creek bridge at $5.49 for concrete foundation, $5.97½ for neat concrete work, 17 cents for dry excavation, $1.23 for wet excavation and 17 cents for fills; total, $1,233.50. M. L. Jones & Brother were awarded contract for substructure of Paint creek bridge, at $4 for concrete foundation, $5 for neat concrete work, 12½ cents per foot for piling, 45 cents per foot for driving piling, 40 cents for dry excavation, $1.75 for wet excavation and 17½ cents for fills; total, $3,920.75. Other bidders on the two contracts were: K. C. Talbot & Son, Frank A. Bone, Charles Boyles, J. B. Willis, Wyley & Vorhees, and D. W. Powett.—B. H. Walker, Surveyor, Ross County.

STREET RAILWAYS

Des Moines, Ia.—The Des Moines Interurban Railway Company proposes to extend the Colfax line to Montezuma, Iowa City and Muscatine; the Knoxville line to Albia, Chariton, Oskaloosa and Ottumwa; the Urbandale or Valley Junction line to Dallas Center, Guthrie Center, Audubon and Atlantic; the Perry or Woodward line to Jefferson, Carroll and Rockwell City.

Webster City, Ia.—A franchise has been voted the Boone, Webster City & Interurban Railroad Company for an interurban line from Webster City to Boone.

Badger, Minn.—The business men of Badger, Roseau and adjoining towns propose to establish an electric line from Roseau to Carlsbad, a station on the Sault Ste. Marie, a distance of forty miles.

Hattiesburg, Miss.—The Hattiesburg Traction Company has signed a contract to construct a street railway.

Canton, O.—The Canton-Akron lines have been taken over by the Northern Ohio, which will build an extension from Massillon to Wooster; the Brookville interurban line, operating out of Massillon, will be extended to East Greenville and thence to Wooster.

Castroville, Tex.—A stock company has been organized to build an electric line from St. Antonio to Castroville.

Seattle, Wash.—The Seattle Electric Company will make extensive improvements and extensions to the street railway system.

PARKS

Wilmington, Del.—Wawaset street, between the Park Drive and Lincoln street, will be turned into a park.

Sioux City, Ia.—The Park Commission has purchased a block and a half of land in the Packingtown District for a park.

Louisville, Ky.—City has purchased over five acres, under new $40,000 bridge, from E. A. Goddard, for $2,500, which with five additional acres, donated by H. A. Phillips, will be converted into a park.—Board of Park Commissioners.

Brockton, Mass.—Land fronting on Salisbury lake has been purchased for a public park.

Northampton, Mass.—Council has decided to acquire, through condemnation proceedings, the Holley and Prindle properties for a public park.

Pittsfield, Mass.—Hon. Arthur H. Lowe has presented to the town of Pittsfield, Mass., a tract of land for a public playground.

Worcester, Mass.—Mayor John T. Duggan has been informed that more playgrounds are needed in the east and west sides and south end of the city, and has promised assistance.—Benjamin F. Childs, Park Commissioner.

Ann Arbor, Mich.—Dr. W. H. Nichols has presented a 32-acre tract to the University of Michigan, to be used as a botanical garden and park. The Park Board has purchased 23 acres adjoining, to be improved on a uniform plan.

Kansas City, Mo.—Council is considering the issue of $250,000 bonds for parks and boulevards.

Conneaut, O.—Bonds, $22,000, have been authorized for parks.

MISCELLANEOUS

Wilmington, Del.—Maj. C. A. F. Flagler has held up bid of the River and Harbor Improvement Company, of Philadelphia, Pa., for dredging the Christiana river, at 27 cents per cubic yard, being considered too high; new proposals will probably be invited.

Pensacola, Fla.—The construction of a garbage crematory has been recommended.—Chairman Zelius, Board of Public Works.

Decatur, Ga.—Bids will be received, October 15, noon, for $44,000, 5 per cent. 30-year municipal gold bonds.—J. A. Montgomery, Mayor.

Lebanon, Ind.—The Commissioners of Boone County have decided to construct the Anderson-Wilson drainage ditch in Harrison township.

Des Moines, Ia.—The City Engineer is locating a new channel of the Raccoon river at the confluence with the Des Moines river.

Canajoharie, N. Y.—The Advisory Board of Barge Canal Engineers has decided to recommend an additional dam on the Mohawk river at Canajoharie, to obviate the necessity of excavating for a deeper channel for the new canal.

Freeport, L. I., N. Y.—The Rural Sanitation Company of New York City has petitioned the Board of Village Trustees for a franchise to construct and operate a plant for the disposal of garbage.

Utica, N. Y.—Harry W. Robert & Co. have been awarded the contract for cleaning the streets for five years, for $13,574 per year for District No. 1; $13,724 for District No. 2, and $12,107 for District No. 3.

LEGAL NEWS

A Summary and Notes of Recent Decisions —Rulings of Municipal Interest

Bond Issue Upheld

Brown et al. vs. **City of Knoxville.**—The enabling act, passed by the General Assembly, was declared constitutional and the proceedings of the City Council in ordering a bond issue were upheld. The court holds, further, that the objections made to the proceedings of the City Council were frivolous and insufficient. The effect of the decision is that the city can proceed with the sale of waterworks bonds.—Chancery Court, Knoxville, Tenn.

May Issue Certificates

Taxpayers vs. **City of Chicago.**—In refusing to grant an injunction restraining the city from issuing certificates to purchase street railroads under the Muller law, the court declared it was the evident purpose of the Legislature and of the City Council to give the city the right to own and operate the street railways. He declared that while there might be some doubts in some points regarding the intention of the Legislature, he believed the doubt should favor what appeared to be the intention in the enactment of the measure. The decision gives the city the right to carry parcels in the proposed railway system.—Circuit Court, Chicago, Ill.

Limitation of Liability

Switzer, vs. **Harrisonburg, Va.**—The liability of a municipal corporation for the death of an employee from injuries inflicted in the performance of an ultra vires act is denied.—Virginia Circuit Court.

City Without Authority

Commonwealth vs. **Brown.**—The city of Allegheny has no authority to appropriate money for the relief of the suffering in San Francisco due to the recent earthquake.—Common Pleas, Allegheny County, Pa.

Individual Rights

Richmond vs. **Caruthers.**—The right of a municipal corporation to deprive the owner of a dead animal of his property right in the carcass by giving to public contractors the exclusive right to dispose of it prior to its having become an actual nuisance is denied.—Virginia Circuit Court.

BOOK REVIEWS

Guarding a Great City.—By William McAdoo, Police Commissioner of New York City, 1904 to 1906. Harper & Bros., New York.—Ex-Commissioner McAdoo has done a service to the Police Department of New York, to the members of that force, and to the future Commissioners of that and other cities by making public his impressions and conclusions after two years of honest and earnest personal effort to improve their conditions. Incidentally, he has written a very interesting description, not only of police conditions, but also of social conditions on the East Side of that city. On many points he is undoubtedly prejudiced, or, at least, would be considered so by a large number of citizens; but most of

these prejudices evidently result from his whole-hearted interest and belief in the members of the force. The newspaper criticisms of them and of himself evidently cut him deeply, and he accuses the police reporters and even the managers of intentional misrepresentation and even persecution of them. Chinamen he has no use for, and he believes that much maudlin sentiment is worse than wasted on negroes of the baser sort. Many magistrates, he declares, greatly hinder the ends of justice and hamper the police in performance of their duty, although he has "great respect for some of them as honorable and upright gentlemen as well as efficient judges." Much of this last-described feeling and his impatience at judicial review of the Commissioners' acts may probably be attributed partly to the influence of his training in the Navy Department. On the other hand, many of the excellent ideas which he introduced and which have been continued are probably due to his experience with the discipline of that department; notably the traffic squad and traffic regulation.

Those connected with Police Departments will probably be most interested in his ideas as to the requisites of a model force, and his recommendations as to methods of handling problems. He knows of no adequate substitute for the plain-clothes roundsmen, but the Commissioner must also have personal knowledge that the police do their duty. (The author "read every anonymous letter that professed to give information.") He should have a life tenure of office or one for a long term. The Detective Bureau is considered to be the most important in the department, and should be composed of men showing special ability along this line, rather than in passing Civil Service examinations, and be entirely separate from the uniformed force. An absolute age limit should be set for compulsory retirement. The uniforms of all grades he considers to be a very important matter, affecting the self-respect of the men as well as the respect of others for them. The giving of honors and medals, he considers most desirable, but requiring the most impartial discrimination to be effective. Commissioners, as well as the District Attorney, must use outside agents and unofficial expenditures in obtaining evidence, especially against gambling and similar evils. The regulation of traffic he considers not only a police function, but one of the most important ones; and for the directing and diverting of traffic he would employ mounted police and substitute for the present guards of suspended ropes, stone guards similar to curbing. Detailing police to special assignments he considers an unfortunate necessity at present. Politics and the Police Department should be absolutely divorced; the effort to use a "pull" for advancement is one of the minor evils connected therewith, and "nearly as many clergymen came to see me in regard to these favors as politicians or district leaders."

The Commissioner's description of conditions on the "East Side" shows his great admiration for the intelligence and earnestness of the Jews as a race, and his deep sympathy for all the poor of the various nationalities herded there.

CONVENTION NOTES

Program of the Birmingham Convention; American Society of Municipal Improvements.—The following is the official program of the Convention of this society, which meets at Birmingham, Ala., October 9, 10, 11 and 12.

Tuesday, October 9.—

10 a. m. Meeting of Executive and Finance Committees. 11 a. m. Delegates and visitors register at City Hall. 2 p. m. Opening of the convention in Convention Hall. Address of Welcome, by Hon. George B. Ward, Mayor of Birmingham. Response by the President of the Society, Mr. C. C. Brown, Indianapolis. The regular order of business will then be taken up, followed by reports from the Committees on Exhibits, Municipal Data and Statistics, Fire Protection and Park Development. 8 p. m. Paper on "The Municipal Control of Planting and Care of Shade Trees," by William Sclotaroff, East Orange, N. J. Also other papers on Parks. Report of the Committee on Taxation and Assessment, by William S. Crandall, Chairman, New York City. Report of the Committee on City Government and Legislation, Thomas J. Neville, Chairman, Rochester, N. Y. Report of the Committee on Municipal Franchises, L. H. Weisleder, Chairman, Cincinnati, O. Report of Committee on Review, A. Prescott Folwell, Chairman, Easton, Pa. Appointment of Committee on Nomination and on Place of Meeting.

Wednesday, October 10.—

9:30 a. m. Explanatory Address on the Birmingham District, by J. W. Bowron, Birmingham, Ala. Following this address the convention will be tendered a drive by the Commercial Club and citizens. The route will include the points of interest in the city and will be extended across the mountain to the waterworks pumping station. On the return trip a stop will be made at the reservoir and filter plant on Shades Mountain, where an old-fashioned Southern barbecue will be tendered by the Birmingham Waterworks Company. 8 p. m. Paper on "The Improvement of Elizabeth River by Eliminating Sewage Pollution," by W. H. Luster, Jr., Elizabeth, N. J. Paper on "Sewage," by Alexander Potter, New York City. Paper on "Yellow Fever and Sanitation," by J. N. Hazelhurst, Mobile, Ala. Paper on "The Improvement of the Sanitary Condition of the Gowanus Canal, Brooklyn," by Henry R. Asserson, Brooklyn, New York. Report of the Committee on Electric Street Lighting, by E. A. Fisher, Rochester, N. Y. Report of Nominating Committee and Election of Officers. Report of Committee on Place of Meeting.

Thursday, October 11.—

Excursion by train around the industrial district surrounding Birmingham, tendered by Commercial Club and citizens. Route to include visits to iron ore and coal mines, limestone quarries, coke ovens, steel and rolling mills, pipe foundries and sewer pipe factories, shale paving brick factories, slag cement works, etc. 8 p. m. Report of the Committee on Waterworks and Water Supply, Julian Griggs, Chairman, Columbus, O. Paper on "The Cost of Cleaning and Grubbing a Reservoir Site," by Julian Griggs, Columbus, O. Paper on "The Recent Advances in the Purification and Softening of the Public Water Supplies," illustrated by stereopticon, by George W. Fuller, New York City. Paper on "The New Orleans Waterworks," illustrated by stereopticon, by George G. Earl, New Orleans. Paper on "The Waterworks of Archangel, Russia," by Ulrich E. Taubenheim, Archangel.

Friday, October 11.—

9 a. m. Inspection of Exhibits. 10 a. m. Report of Committee on Disposition of Garbage and Street Cleaning, by T. Chalkley Hatton, Chairman, Wilmington, Del. Paper on "Street Cleaning and the Disposition of Sweepings," by T. Chalkley Hatton. Paper on "A Proposed System of Final Waste Disposition for the City of New York," by H. C. Bayles, New York City. Report of the Committee on Street Paving, by James Owen, Chairman, Newark, N. J. Paper on "The Municipal Asphalt Plant at Hamilton, Ont.," by E. G. Barrow, Hamilton. 2 p. m. Paper on "Earth Settlement in City Streets," by Horace Andrews, Albany, N. Y. Paper on "Chert Roads," by Prof. Edgar B. Kay, Birmingham. Paper on "Paving and Paving Materials of the Southwest," by Walter F. Reichardt, Little Rock, Ark. Paper on "The Tests of Other Woods than Yellow Pine for Block Pavements," by F. A. Kummer, New York City.

Annual Convention of the Mayors' Association of Texas.—The Association met at Forth Worth, September 20 and 21. Papers were presented on "Purification of Sewage," by John W. Maxcy, of Houston, which subject was later discussed at great length; on "City Sanitation," by Dr. J. C. Chase, of Fort Worth; on "Care of Paupers by Municipal Governments," by Mayor W. D. Harris, of Fort Worth; on "Waterworks and Water Supply," by John B. Hawley, of Fort Worth. "Shall Municipalities Own Their Own Utilities?" and "Why Should Cities of Over 5,000 Inhabitants Not Have a Special Charter?" were discussed by the Association.

Calendar of Meetings of Municipal and Allied Societies

October 1-6.
Pennsylvania State Firemen's Association.—Convention, Gettysburg, Pa.

October 3-5.
Kansas State Firemen's Association.—Convention and Tournament, Lawrence.—Walter Puckey, Secretary, Clay Center.

October 5.
Brockton Fair Association.—Hand Engine Muster.

October 9.
American Society of Municipal Improvements.—Annual convention, Birmingham, Ala.—George W. Tillson, Secretary, Municipal Building, Brooklyn, N. Y.

October 9.
West Virginia Board of Trade, Charleston.—R. B. Naylor, Secretary, Wheeling.

October 9-12.
International Association of Fire Engineers.—Annual convention, Dallas, Tex.—Jas. McFall, Secretary, Roanoke, Va.

October 11.
Veteran Volunteer Firemen's Association.—Grand parade.—Neil McLeod, Jr., Secretary, 1213 Grand street, Elizabeth, N. J.

October 15-19.
American Street and Interurban Railway Association.—Annual convention, Columbus, Ohio.—B. V. Swenson, Secretary, 30 Wall street, New York City.

October 16-18.
Southern New York Volunteer Firemen's Association.—Convention, Flushing, L. I.—J. H. Downing, Secretary, 130 Fleet street, Brooklyn, N. Y.

October 24-26.
American Civic Association.—Annual convention, Milwaukee, Wis.—Clinton Rogers Woodruff, Secretary, 703 North American Building, Philadelphia, Pa.

October 29.
New Jersey State Firemen's Mutual Benevolent Association. — Convention, Atlantic City, N. J.—R. D. Bender, Secretary, 212 Halsey street, Newark, N. J.

November 13-15.
Southern Immigration and Quarantine Conference, Nashville, Tenn.

November 13.
New York State Conference of Charities and Corrections. — Seventh conference, Rochester, N. Y.—Walter E. Kruesi, Secretary, 105 East Twenty-second street, New York City.

November 14-16.
International Congress on Tuberculosis.—New York City. (The principal purpose of the congress will be that of urging preventive legislation against tuberculosis, the adoption of municipal and government sanitariums and discussion of all the questions involved.)

November 15.
National Society for the Protection of Public Health and Morals.—To be organized at Hudson Theater, New York City.

November 15-16.
Deep Waterway Convention, St. Louis, Mo.—Hon. Henry T. Rainey, Secretary, Carrollton, Ill.

November 15-17.
Mississippi State Firemen.—Convention to organize an Association, Hattiesburg.—Chief A. F. Potter, Secretary, Hattiesburg, Miss

January.
American Institute of Social Service.—Exposition, New York City.—Dr. William H. Tolman, Director, 287 Fourth avenue, New York.

PERSONALS

Badger, D. C., Mayor of Columbus, O., has expressed his disapproval of an ordinance appropriating $5,000 for a landscape artist and another for the improvement of Livingston avenue by returning them to the City Clerk, but they will become effective without his signature, after the usual publication.

Belt, William T., Chief Engineer of the Fire Department, Washington, D. C., has been authorized by the District Commissioners to attend the annual convention of the International Association of Fire Engineers to be held in Dallas, Tex., October 9 to 12, inclusive.

Benner, John E., Chief of Police of Hagerstown, Md., recently made a trip to New York and other cities to study police affairs and view the sites, and on his return home expressed himself as liking Hagerstown better than any place he had seen.

Bieber, Sidney, former Fire Marshal of Washington, D. C., who was retired in consequence of exposure incident to the big fire at Baltimore, Md., has almost entirely recovered and was in New York recently, after a sojourn in the Adirondacks, to accept a position as Treasurer of the Republican Congressional Committee for the District of Columbia and vicinity. He went South in time for the Baltimore celebration and, on the return of the Washington firemen to the capital, rode with Chief Engineer William T. Belt at the head of the procession.

Dyer, J. Milton, an architect of Cleveland, O., has been engaged by the Board of Public Service of that city to draw plans for a new auxiliary high-pressure pumping station, which will also furnish municipal light, heat and power. The plant will cost $500,000.

Griswold, George M., has been reappointed by Mayor Studley, of New Haven, Conn., as a member of the Board of Examiners to pass on the fitness of men to run stationary engines, for a term of three years, the other members being Louis D. Behler and Max Jordam.

Harrison, Edlow R., Engineer of the Passaic Valley Sewerage Commission, has returned from a trip to Great Britain and Continental Europe, where he made a study of the sewerage systems of the large cities.

Hine, George M., who has been nominated as Mayor of Poughkeepsie, N. Y., for a fourth term, William Morgan Lee, Corporation Counsel of the city for sixteen years and John C. Welch, member of the Board of Aldermen, were guests of friends in Erie, Pa., while on their way to attend the convention of the League of American Municipalities at Chicago.

Johnson, Tom L., Mayor of Cleveland, and Peter Witt, City Clerk, were visitors to Toledo recently and Mayor Brand Whitlock was afforded the opportunity to take up with the Cleveland Executive the matter of enforcing the auto speeding laws.

Leisen, Theodore, Chief Engineer of the Waterworks Department of Wilmington, Del., recently made a trip to Buffalo, N. Y., to inspect the 12,000,000-gallon pump which has just been completed for the new pumping station at the Delaware capital.

McKenty, Robert, a former detective of Philadelphia, Pa., has been appointed by Mayor John Weaver as Director of Public Safety of the Quaker City, vice Colonel Sheldon Potter, whose resignation was demanded.

Perkin, Sir William Henry, will be the guest of honor at the celebration of the Perkin jubilee of the coal tar industry to be held at Delmonico's, New York City, October 6, when there will be a symposium of the coal tar industry, a banquet and after-dinner speeches.

Van Buskirk, Eugene, Superintendent of the National Association of Criminal Identification, Washington, D. C., has been detailed by Mayor Richard Sylvester, Superintendent of Police of the capital city, to teach the Police Department of Norfolk, Va., the Bertillon system, in preparation for the army of criminals who will visit the Virginia city in attendance on the Jamestown Exposition.

Some Unusual Fires

Buffalo, N. Y.—The Keystone Warehouse Company's barns and storehouse, burned, September 22. Damage, $100,000.

Chicago, Ill.—A blazing train of cars threatened destruction of the new government pier at South Chicago. Hot slag with which cars were loaded started the fire.

Detroit, Mich.—Three barns in different locations, belonging to Garner Bros., burned, September 16. Cause, incendiary. Damage, $6,000.

Philadelphia, Pa.—Cigar box factory of Henry H. Shelp & Co., burned, September 24. Damage, $125,000.

Tacoma, Wash.—The Tacoma Eastern Railroad depot and freight warehouse, burned, September 20. Damage, $150,000.

Topeka, Kan.—Crawford Opera House, burned, September 24. Damage, $100,000.

SEAGRAVE SPRING HOISTING AERIAL TRUCK

A FIRE FIGHTER

The Seagrave Spring Hoisting Aerial Truck, manufactured by the Seagrave Company, Columbus, Ohio, is simple in operation and construction; it is claimed that it can be elevated to a height of 65 feet in about 15 seconds—an operation which, with an old-fashioned ladder, used to require a minute and a half. The ladder is made in three sizes, 65, 75 and 85 feet. The base of the ladder is attached to a turn-table with steel forgings, in the construction of which lightness and strength have been considered. The springs which balance the weight of the ladder are enclosed in steel tubes and operate by expansion. The governing screw is attached to the frame by an adjustable ball and roller bearing journal box hung on a vertical axis and works in a bronze nut hung on both a horizontal and a vertical axis to avoid any danger of binding. The screw is operated by a bevel gear and winch handles. The turn-table makes a complete circle, thus permitting the ladder to be placed against the building without removing the horses, and is so balanced as to avoid danger of overturning. The trussed brake on the front wheels is one of the features of the machine and applies the power close to the brake block to avoid bending the beam.

TRADE NOTES

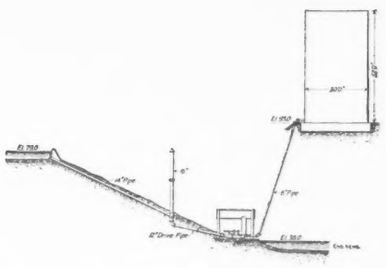
Electric Generators.—The Crocker-Wheeler Company, Ampere, N. J., in Bulletin No. 69, describes its small generators arranged for direct connection to steam or gas engines. These generators vary in capacity from 1½ k.w. to 19 k.w.

Fire Hose.—The Eureka Fire Hose Company, Church and Duane streets, New York City, issues a folder describing three of its twenty-three brands of fire hose and the methods of manufacture. The highest grade, the Eureka, is a four-ply, rubber-lined, seamless, circular, solid-woven, multiplex hose, which in the 2½-inch size weighs 60 pounds per length of fifty feet.

HYDRAULIC RAMS

For General Use at Waterworks of Moderate Capacity—Reliable in Operation—Government Tests Show Average Efficiency

For those small waterworks plants in which there is a moderate fall of water available for power, and where it is required to raise a portion of the water to a higher level, a hydraulic is probably the most appropriate contrivance. A good ram can be used effectively when the fall is between 2 and 50 feet; and for the best rams, it is claimed that they can deliver one-third of the water used 2½ times as high as the fall; one-sixth of the water five times, one-twelfth ten times, etc., up to 500 feet elevation. Such a ram will pump with good efficiency against heads 25 to 30 times as great as the fall, although the efficiency falls as the ratio increases. The Rife hydraulic ram, for instance, claims an efficiency of 90 per cent., with a 3-to-1 ratio, but only 70 per cent. with a 15-to-1.



HYDRAULIC RAM—NAVAL COALING STATION, BRADFORD, R. I.

Contrary to a popular impression, there would seem to be no good reason why the use of rams should be confined to small quantities of water. The ram just mentioned is used to supply the towns of Bristol, Vt., Wyomissing and Reading, Pa., Tuckerton, N. J., Nacogdoches, Tex., Biloxi, Miss., Ozark, Mo., Montezuma, Ga., Romney, W. Va., Waynesboro, Va., and Thurso, Canada. These rams, being practically without wearing parts which require lubrication or frequent adjustments, do not need the care of an attendant. It is claimed that their operation is reliable and repairs few because of the small number of parts liable to derangement; that they need not be protected from the weather, and will work equally well out of doors and uncovered; and that foundations are not necessary. It is said that Tuckerton, N. J., has been supplied by one of these rams for eight years, at an annual expense of $12 for repairs, the fall being 6 feet and lift 100 feet.

The illustration shows the method of installation at the Naval coaling station in Bradford, R. I. Two of these machines were put in during the summer of 1903 for pumping water into a tank which furnishes fire protection and also supplies the various buildings on the grounds and the vessels which tie up to the dock. Careful tests were made of the plant when completed by Government engineers, and the rams were shown to develop an average efficiency of 90 per cent., as per Government test, as follows:

Two Government tests of No. 120 Rife Hydraulic engines at U. S. Naval coaling station, Narragansett Bay, Newport, R. I.:

	No. 1.	No. 2.
Total water delivered to engine, gals. per min.	582	578
Water delivered to stand-pipe, gals. per min.	232	228
Power head in engines, feet	36.75	37.25
Pumping head in feet	84.0	84.0
Strokes per minute	130	130
Efficiency, per cent	91.23	89.06

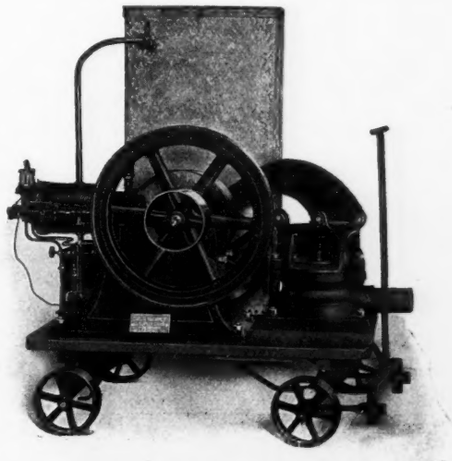
These rams could use 750 gallons per minute each. Only 582 were available when the tests were made.

PORTABLE PUMPING OUTFIT

For Use of Contractors Engaged in Foundation and Sewer Work—Motive Power and Apparatus—Rubber Diaphragm Pumps

A PORTABLE pumping outfit is being put on the market by the Carlin Machinery & Supply Company, Inc., of Allegheny, Pa., for the use of contractors, and especially those engaged largely with foundation and sewer work. It consists of a gasoline engine rated at two horsepower, a 3-inch suction diaphragm pump, and a circulating water tank, all mounted on a small, well-built four-wheel truck. The regular three-inch suction gives the outfit a capacity of 3,000 or 4,000 gallons of water per hour, but a pump having a four-inch suction, rated to handle 6,000 gallons per hour, is also furnished. The entire outfit weighs 930 pounds.

The value of rubber diaphragm pumps as hand-power pumps for handling large quantities of water, regardless of quality, has long been recognized, as they are not subject to the cutting action of dirt and grit, which is one of the objections to a cylinder pump. The pump operates by the raising and lowering of the diaphragm, displacing a certain amount of water at each movement, rubber-seated check valves being provided above and below the diaphragm for holding the water. The Loud pump is the one which has been selected for use in this outfit.



A PORTABLE PUMPING OUTFIT
(Showing Gasoline Engine and Water Tank)

Motive power is supplied by a two-horsepower horizontal four-cycle gasoline engine, built to secure compactness, simplicity and accessibility to all parts. It has less vibration than the vertical type and will develop considerably more than two horsepower when desired. A pendulum governor, which can be regulated while the engine is running, controls the speed, while the life and reliability of the machinery is added to by large wearing surfaces.

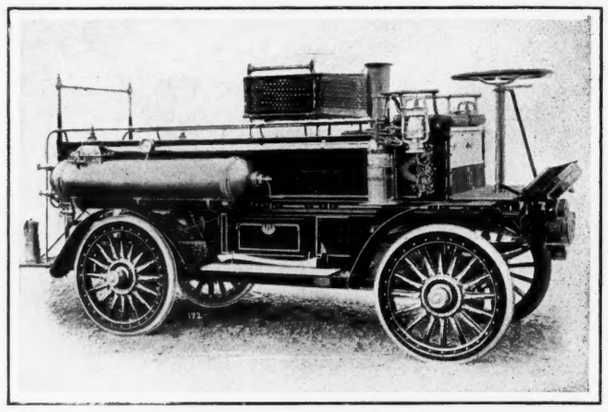
The gasoline is delivered to the glass cup or mixing valve, which serves as a sight indicator to the operator, through a very small feed pipe, which is attached to the engine. The valve supplies the explosive vapor in amounts proportional to the work done, the surplus gasoline returning to the tank through an overflow, and, as it is entirely inclosed, all danger of explosion is eliminated. The machine work is guaranteed to be high-class and cut gears are used exclusively. The cast-iron cylinder jacket is removable, which makes it easy to repair in case of freezing.

A piston or pressure pump can be added for testing a pipe line by water pressure, when either pump may be operated singly.

MOTOR FIRE AND POLICE APPARATUS

THE accompanying illustrations show two styles of motor appliances for municipal service, an electric police patrol wagon, manufactured by the *General Vehicle Company, of Long Island City, N. Y.*, and a steam combination fire wagon, manufactured by the *American La France Fire Engine Company, of Elmira, N. Y.* The former style is designed as an electric vehicle, with all the advantages of easy control, and the latter, a steam vehicle, is independent of a special source of power. In both cases there is a saving of floor space in the fire house or patrol station and the advantages of speed are obvious. A considerable number of these vehicles are in use in large cities and are reported as giving general satisfaction. Since their utility has been proven, there is little doubt that the number in use will continue to increase.

A MODERN PATROL WAGON



COMBINATION FIRE WAGON
(Steam Automobile)

A MOTOR ICE WAGON

THERE has recently been furnished to the Charter Oak Hygeia Ice Company, of Hartford, Conn., by the General Vehicle Company, of Long Island City, a motor ice wagon of five tons' capacity, driven by a 19-plate, 44-cell battery, double-chain drive. It is fitted with scale racks and tong racks; is 13 feet 9 inches long, 5 feet 5 inches wide and 5 feet 9 inches high, inside dimensions. It is capable of a speed of six miles an hour and a radius of twenty-five miles on one battery charge; the controller giving four speeds forward and two reverse. A similar one has been furnished to the Key West Ice Company. This is but one illustration of the tendency toward the use of heavy vehicles in city streets, which the motor makes possible.

A MOTOR ICE WAGON
(Capacity, 5 tons)

NEW TYPE ENGINE.—The Atlas Engine Works, Indianapolis, in Bulletin 132, describe at length their medium-speed automatic four-valve engine. The problem of steam economy as it appears to them is this: "A throttling, single-cylinder engine exhausting to the atmosphere will probably be the lowest in first cost, but will require 40 to 65 pounds of steam per horsepower hour. An automatic engine will take 30 to 35 pounds non-condensing, and 25 to 30 pounds with a condenser, while a four-valve engine will require only 25 to 30 pounds non-condensing, and as low as 19 pounds condensing. If high-pressure steam is available or the plant is of large size or is to be operated 24 hours a day, it may pay to put in compound-expansion engines, by which means the steam consumption may be reduced to 12 or 15 pounds per horsepower hour."